

**MAHARANA BHUPAL
COLLEGE,
UDAIPUR.**

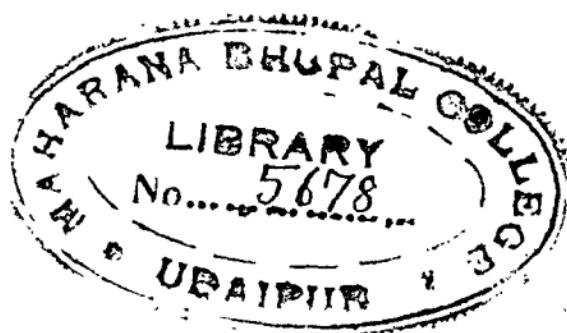
Class No.....

Book No.....

PRESENT-DAY TRAVEL AND ADVENTURE

PREPARED BY

W. A. BARNES, B.A., (Hons.) Lond.
CENTRAL TRAINING COLLEGE,
LAHORE.



LAHORE
UTTAR CHAND KAPUR & SONS,
PUBLISHERS.
1931

ACKNOWLEDGMENTS.

Acknowledgments are due and are gratefully made to the following publishers and authors for permission to reproduce extracts from their publications: to Messrs. Arrowsmith for the selection from Mr. Cherry Kearton's book, "Photographing Wild Life Across the World"; to Messrs. Benn for the chapters from Mr. Williamson's "In a Persian Oil Field;" to Mr. C. R. E. Enoch, for the chapter taken from his "America and England"; to Seeley, Service & Co., for the extracts from Mr. Douglas Ashley's "Things Seen in Switzerland in Summer;" to Messrs. A. and C. Black, Ltd., for chapters from Mr. F. A. Talbot's book on "The Canadian Pacific Railway" in their series called "Peeps at Great Railways;" to William Heinemann, Ltd., for the extracts from Sir Ernest Shackleton's "South;" to Messrs. A. and C. Black, Ltd., for the selection from Sir Alan Cobham's "My Flight to the Cape and Back"; and to John Lane for the chapters from Mr. Ellis's "Express to Hindustan."

W. A. B.

INDEX.

	PAGE.
1. PHOTOGRAPHING WILD LIFE IN EAST AFRICA	1
2. IN A PERSIAN OIL FIELD	25
3. AMERICA AND ENGLAND	46
4. SWITZERLAND	75
5. THE CANADIAN PACIFIC RAILWAY ..	98
6. SOUTH	117
7. MY FLIGHT TO THE CAPE	145
8. TRAVELLING THROUGH IRAQ AND PERSIA	160
NOTES	189

TRAVEL AND ADVENTURE.

1. PHOTOGRAPHING WILD LIFE IN EAST AFRICA.

In 1911 I took part in a second expedition to East Africa, for the purpose of proving man's power over the wildest animals with no weapon save a rope. The expedition was a large one, and, of course, the baggage was in proportion. I believe that really the hardest part about a trip which turns out a success is the making of the preliminary arrangements. The expedition which fails usually does so because the preliminaries have been neglected. Too much stuff, too little stuff, or the wrong stuff, any of these causes, but especially the first and last, will serve to land you in difficulties, and, if the trip is really a long one, taking you far from supplies, in disaster.

On this occasion our party consisted of seven Europeans, some hundred natives, five horses, and seven dogs of various sizes and breeds or combinations of breeds—indeed a mighty company.

I shall never forget the seemingly awful confusion on the platform of Nairobi Station that morning. We arrived there at 11-30 a.m. to catch the 1 p.m. train, and we were none too early. The place seemed alive with savages—our savages. And they were not behaving with dignity. Everyone seemed to be afraid he was going to be left behind. If he did not attempt to fight his way into an already overfull carriage he climbed on top of it, and had to be hauled down by a perspiring official.

The baggage was in stacks, great piles of it, which made one feel guilty of some awful crime, it seemed so utterly out of proportion. Case after case of provisions; ugly bundles, which when united would form parts of tents, folding tables and chairs; weirdly-tied packages of cooking gear; small, heavy boxes of ammunition; bags of food for the carriers and bags of food for the dogs—all had to be sorted out, counted, checked, and packed in the vans. We began, as I said, at 11-30 a.m. and our train finally got away at 4 p.m.: at least, we were ready at that time. Then a final count was made, with the result that six native stowaways were discovered and ejected ungentlely, their discomfiture apparently amusing their fellow-countrymen immensely.

I heaved a sigh of relief as the guard blew his whistle and we really started. There is a steep gradient up to Limoru, which is in the Kikuyu country. From there onwards one climbs upwards more steadily through thick forest all the time to the Kikuyu escarpment, the top of which is nearly eight thousand feet above sea-level. From this point the view is magnificent. Two thousand feet below is the Great Rift Valley, through which we were to operate, and which extends southwards through the heart of the continent to the very home of African adventure, the Zambezi itself. The great stretch of plain is broken only by the two volcanic mountains, Longonot, which is close to the line, and Suswa, away in the distance. So clear is the air that one can see for nearly a hundred miles. Objects a quarter that distance off appeared quite close, but when we came to trek across the veldt to them the twenty-five miles turned out to be long ones.

From the top of the escarpment the line descends again to Kijabe (meaning "wind"), which was the end of our railway journey.

At sunrise we were up. Fires were lighted—one of the beauties of the veldt is that you may light a fire anywhere if you can procure fuel—coffee made, and the work of off-loading the baggage begun. Perhaps this was even worse than the loading of the day before had been, because now it was a matter of apportioning the packages. In addition to the carriers we had four bullock-wagons, not the great eighteen-foot-long transport wagon of the south, with a "full soan" of sixteen or eighteen big oxen, but a slightly smaller and more suitable kind, with fourteen cattle. On the wagons were big water-drums, for we had some long stretches of waterless plain ahead of us.

It was a great sight to see our safari set out. In addition to the carriers, the horses, the dogs, and the wagons, there were two cooks, a personal boy for each white man, five camera boys and my Masai spearman. Each carrier's load is nominally sixty pounds. This figure is rarely exceeded, and when the package is unusually bulky or awkward due allowance is made for the fact. On a really long journey, when the safari marches every day for months, sixty pounds is, of course, too much, but for an expedition such as ours it is quite a reasonable weight. As a rule the load is carried on the porter's head, but occasionally it is hung on the shoulders by a strap passing round the bearer's forehead.

The immense variety of loads adds greatly to the picturesque appearance of a caravan. One man will have a "chop box," a case containing tinned meats and other "white man's food"; the next may have some folding chairs and tables, awkward, ungainly; the man behind him may perspire under a portion of the tent canvas. As a rule a man keeps the same load all through the trip, though naturally, as the bags of food stuffs and boxes of tinned meats become emptied, there is a certain amount

of redistribution.

The safari always treks in single file, often to the accompaniment of a monotonous sort of native chant. The cooks and personal boys travel light, their work beginning at the outspan when the carriers are resting. Really their job is no easy one. There is plenty of work for these cooks and personal boys when the white men are doing things comfortably, and, after all, why should one not study comfort? It is not as if East Africa were in the pioneer stage. There is always the railway a little way off, even though there are various lions and rhino between you and the line.

As a rule the tents are pitched in a circle, the white men's tents being grouped together. Next to them will be the cook's quarters, where all the meals are prepared. Personal boys sleep under their employer's verandah. The carriers' tents complete the ring. Every here and there are huge fires, which the watchmen tend, for one is always on the alert for the possible lion. Horses and dogs are tied up in the middle of the encampment.

This was the arrangement on the first night of that trip. I think most of the party slept well on that occasion, for it had been a very heavy day for all.

We had some luck the first day out. Of course, it was yet too early to expect to find lion and rhino, though both of them generally come unexpectedly, but we did find wart-hog. I was very glad, because it gave me at once an opportunity of seeing whether my American companions, Mr. Jones and his two assistants, Messrs. Loveless and Means, really could do what I wanted.

I had, of course, heard and read stories of the feats of American cowboys, how they could lasso anything, but one does not hastily take such yarns at their face value, and I had, I admit, had certain misgivings regard-

ding this trip. Consequently, I was greatly delighted when I found that my men were really first-class hands at their own particular work, quick, fearless and excellent horsemen.

Ulyate, the professional hunter, reined up suddenly and pointed to three black objects about four hundred yards away. They were wart-hogs, he said.

Away went the Americans to drive them up to us, whilst I sent my assistant to hurry on the carriers with the cameras. The latter turned up in time, and I had them fixed in a convenient place.

Meanwhile the carriers squatted down, waiting with the dull apathy of the African savage. Certainly a few did watch the proceedings; but to most of them it was simply an example of the foolishness of the white man, and unless the affair resulted in their getting meat for that evening's meal, it did not concern them in the least degree.

The horsemen had now got the wart-hogs on the run, and were doing their work cleverly. After a while they very wisely let the two smaller beasts go and concentrated all their efforts on the big boar. He went well, snout down, tail in air, his great tusks showing viciously. He did not like the game in the least; he did not understand it, and he was going to escape to cover if he could, but if he were cornered he was ready to fight to the last.

One of the Americans, who was mounted on a black horse, drew ahead of his fellows, and I saw him begin to loosen the lasso on his saddle. Then he was swinging it round and round his head ready to let go. As the boar passed my camera the noose seemed to dart out and catch him round one of his hind legs, and a moment later he was rolling over in a cloud of dust.

As a matter of fact the horseman had miscalc-

things, having driven his quarry straight on to the lens instead of three-quarters on to me. But he was new to it, and he had done his best. I obtained some excellent pictures of the animal on the ground and also of him when, having recovered from his fright, he tried to charge at the horse's legs. When he was let go he gathered himself together, glanced once at the carriers, who had now clustered round, then walked away slowly and disdainfully. The natives, seeing so much meat going off, were far from pleased. But my object in taking this trip was to photograph game, not to slaughter it, and their disgust did not worry me greatly.

We camped for the night at Sewell's Farm, close to a "pan" of water. A high wind was blowing, and at times the dust was far from being pleasant. As there was the possibility of finding water-holes ahead dry or full of liquid mud, we filled up the tanks on the wagons, as well as every other vessel capable of holding water. In Ulyate, the hunter, I had a man who knew his business, and, acting on his advice, I took no chances. You can do without a good many things on the veldt—without tents, without folding chairs and tables, without whisky, even without food at a pinch—but you must have water.

On the march the three cowboys rode ahead, whilst I was close at hand with my camera ready for instant use. We might hit on something interesting at any moment.

It was hot and dusty, terribly hot, but there was no question of delay. We had the oxen to consider. About noon we made a short outspan, barely worth while really, for the oxen had no time to feed, and even had there been time there was little for them to eat. Trees were conspicuous by their absence, the brush being little more than low thorn scrub, and it was only under the

wagons themselves that one could find any shade.

Soon after we had inspanned and started off again someone noticed lion spoor, and there was a thrill of excitement amongst the new hands, who had not yet realised that 'from the Zambezi to Khartoum you can find lion spoor everywhere, indeed you expect to find it. Of course, there was a chance of coming on the beast who had made it or on one of his relatives. Much sweeping of the country was done without the slightest result, except the tiring of men and horses.

There was plenty of game about. After a while we sighted a troop of eland, the largest and in a way the most beautiful of all antelope, and we arranged to have them rounded up for me to photograph.

I placed my cameras in the most sheltered spot I could find, then sent out the three cowboys, who were to try and lasso one of the animals in front of the lens. Once more they acquitted themselves well. They cut out their eland, then one of them, Loveless, got his lasso well over it, bringing it to the ground. At once he dismounted, apparently with the idea of making the animal's legs fast, but no sooner was he out of the saddle than his great black horse started to misbehave himself.

you judge everything from the point of view of your success or failure in attaining that object.

You cannot, of course, expect to get pictures every day, and after the adventure with the eland I took a blank trek philosophically. It was the luck of the game. We saw plenty of spoor—lion, rhino and odd animals—but we had to push on to the next water-hole and so could spend no time on turning off the track. A leopard and a rhino served to break the monotony so far as the cowboys were concerned, but the rest of us knew that there would be plenty of rhino and leopards—too many, perhaps—ahead.

We camped for the night at a small river, from which I decided to send Ulyate back for another wagon-load of stores, as I wanted to be on the safe side before trekking into the Sotik country. And we were now practically in the Rift Valley, where, as I knew well, both rhino and lions were plentiful, so it was no waste of time to fix up a regular camp and use it as a base until Ulyate returned.

I arranged to have the hunting carried out on a regular plan, using almost all the members of the expedition for the purpose of driving the game up to my cameras. Practically speaking, we had a long line, sweeping round in a semi-circle, with mounted men at each end and carriers between. There were dogs, too, and water-bearers. Roughly speaking, the line must have stretched some four and a half miles. If game were found word could be passed along or, failing that, a signal given by firing a couple of shots in rapid succession.

Naturally enough, the first day started badly. As so often happens when one is dealing with new-comers, there was that fatal delay in starting, that inability to realise that the first two hours in Africa are worth more

than the whole of the next seven put together. Everyone, white men and carriers alike, wants to talk on those occasions, and everyone will go on talking until the man in charge lets off some very plain speech on his own account.

No rhino were seen, but after a while Jones sighted a herd of hartebeeste and signalled to me. The ground was not very good, being broken veldt with a certain amount of low scrub; still, it was worth trying to get a picture.

I gave the word, and the cowboys started the herd on the run. The bulk came down in a cloud of dust right towards the cameras—it was very cleverly managed—then tried to swerve away as they saw my assistant and myself. But a lasso was shot out, and a moment later one was down right in front of me. Almost before he knew what had happened I had secured a film of him, and he had been allowed to race off and rejoin his fellows.

As we came back to camp a serval cat was unwary enough to show himself. He, too, was caught and photographed.

Our third drive was productive of some real excitement. We found neither lions nor rhino, but a cheetah was marked down. He took cover in some long grass, and was still there when I arrived on the scene. A little way off was a small spruit. At once I got the cameras ready, whilst the cowboys set out with the idea of driving him down to me. But that cheetah had plans of his own, and without the slightest warning jumped up and headed for the spruit, where he hid in some undergrowth.

It was an ugly place, but Jones settled the matter in cool, characteristic fashion. He rode to the bank of the spruit, almost asking the animal to come at him, and when it accepted the invitation he lassoed it neatly, after-

wards dragging it out in front of my camera, greatly to the amazement of the carriers.

That night Ulyate returned with the wagon-load of additional stores, so we decided to break camp first thing the following morning, and start out for the Sotik country, where I hoped to meet with better success than had been the case hitherto.

We trekked on and on that day across that sweltering plain. As usual, the white men rode ahead of the safari, so as to cover a considerable extent of the country, but all the time luck seemed against us. I for one was growing very weary of the march, and was feeling the sun severely, when Ulyate suddenly pointed to a clump of trees a little ahead.

"There are giraffe there," he said.

I looked carefully, and there, surely enough, I could see things moving amongst the tree-tops.

A moment later the animals broke away, stretching out their legs in a gallop. At once the cowboys were after them, but, as we knew, they had little chance. Their horses had been suffering from the heat, for which the giraffe cared nothing. Still, Jones and his two assistants held on; they would never give up so long as their mounts would carry them. I myself, on the other hand, decided to span at that clump of trees. It was hopeless trying to trek on through that heat, and in the unlikely event of the giraffe being turned it would be a good place for working the cameras. We got these ready, threw ourselves down and gasped, thanking our stars that it was not we who were pelting across that baked stretch of veldt. The carriers, too, were glad enough of the rest, and so were the oxen when they came up a little later. Really, of course, it is clean against all the rules of transport work to trek in the heat of the day, but the circumstances

were exceptional. Sometimes the strictest of rules has to be broken, and shortness of water is a sufficient excuse for anything.

After a long while the cowboys came back one by one, hot, thirsty, disappointed. They had found out how a giraffe can run when he is on open veldt.

We rested until well on in the afternoon, then in-spanned again. Hitherto the road had kept along the level plain: now, however, it began to climb steadily up the main escarpment. Ahead of us was what seemed to be kopje country. With every foot we rose the view behind us grew more and more impressive in the vastness of its desolation. It was indeed Africa, the land of infinite distances.

I do not know how much ground we had covered on that trek, but I do know that I was feeling the sun badly, and was wishing it was time to camp for the night, when Ulyate suddenly rode up to tell us that Jones had found a giraffe. He and his companions were away to one side of the track; they had the animal amongst some scrub, and were trying to keep it for me.

Instantly I had forgotten the heat, and regretted the sun was not higher in the heavens, so that there would be more of daylight left for me. It was only a matter of a few minutes to ride back along the line, take the cameras from the carriers, and head for our quarry. We soon saw him. He was standing quite still, apparently dazed at the commotion, and yet ready to bolt when he saw a chance to do so in safety. The cowboys were waiting for me.

The instant I had my camera on the tripod I signalled to Jones, who gave a shout. At once the giraffe seemed to make up his mind that it was time to move. But he had made it up too late. One of the cowboys was after-

him, swinging his lasso.

It was no easy task to catch the animal. To begin with, there was the fact that a giraffe is about the most fragile thing on the veldt. A heavy fall means either a broken neck or a broken limb, and my object was to avoid any injury to my quarry. Then, too, there was his immense height: he was so utterly different from anything else that his pursuer had ever tried to lasso. Yet, so skilful was that American from the plains of the West, that he did the thing at the very first throw. The noose seemed to fall gently and exactly in the right place, and in an incredibly short space of time the huge beast was at a standstill, gazing at his captor with open-eyed astonishment.

I wasted no time over getting to work. There was just enough light to run off my film. Then there remained another question—the giraffe had to be freed again. Once more I had occasion to admire the skill of those Americans. A rope round the hind legs, a steady pull, and the animal was down on the ground. The first lasso was taken off, then the second was slipped. The giraffe scrambled to his feet, shook himself, stood perfectly still, and watched us until we were out of sight over a rise. I wonder what he thought of it all?

II

With the lassoing of the giraffe our luck seemed to have come to an end, at least for the time being. There was a long, waterless stretch of undulating country, covered for the most part with low scrub, in which we saw practically no game. The cowboys were always on the alert, and it is safe to say that no reasonable chance was lost: yet when we outspanned at nights the same unused roll of film was still in the camera.

It was most disappointing. Almost anywhere else we should have been practically sure of sport, but now, by some unlucky chance, we seemed to have struck the worst possible road. Of course, wagons hamper you enormously on a trip such as the one we were making; they compel you to keep within certain narrow limits, and I should advise everyone to do without them as far as possible. For heavy transport work the bullock-wagon is absolutely unequalled, and in the old days the early hunters, like Mr. F. C. Selous, working many hundreds of miles away from their base, could not depend on carriers only; but to-day, when the hunter is merely a sportsman and not a pioneer, the carrier is usually quite sufficient for his requirements.

We had been out rather over a fortnight when the rains, already late in appearing, began to set in. Most of us were more or less downcast at the lack of success, and I think that wet day seemed to take pretty well the last of our spirits out of us, especially as Ulyate declared we might now expect more wet weather, far more than would probably be pleasant.

To our relief the morning broke fine and clear, whilst, as is always the case after the first rain, the veldt seemed to have taken on a new freshness. The dust of months had been washed off leaves and grass, old spoor had been obliterated, everything seemed ready to burst into new life.

The cowboys rode on ahead scouting round, whilst the rest of us kept with the safari, halting every now and then when the wagons fell too far behind. Despite the rain of the night before the heat was again intense, and the slow rate at which we were compelled to travel did not tend to make matters more pleasant.

It was during one of those short halts that Means,

the cowboy, came galloping back along the track. We had now got so used to ill-luck, that really I believe none of us expected him to have any news; consequently, we were more than elated when he informed us that there was a rhino in a valley a short distance off, and that Jones and the other cowboy were holding him up for me.

It did not take us very long to get into the saddle again, to overtake the wagon, which we had allowed to trek on ahead, to hustle the camera porters into new life, and start for the scene of action. After half an hour's riding we came on Loveless, who informed us that Jones was down in the valley keeping watch on the animal, which did not yet know of his presence.

We at once took the cameras from the carriers, and began to creep cautiously up-wind towards a clump of bush in which Jones was hidden.

Fortunately, the light was excellent—it was just about noon—and other conditions generally were in our favour. The cowboys got their ropes ready and started to work round slowly, whilst I went forward on foot quite close to the sleeping rhino, focused my camera on him and gave the signal for the others to close in.

Instantly Jones gave vent to a war-whoop which would have done credit to a Red Indian and, followed by his assistants, dashed up. A moment later the rhino was on his feet trying to get the scent, his great nose in the air, his little purblind eyes peering round. He just gave me time to get some film, then he was away at full speed down the valley, the cowboys in close pursuit. He galloped considerably over a couple of miles before he decided to halt and face his enemies. The place he chose was a good one from his point of view—a dip in the ground where the rains of the night before had formed a small pool. He went right into it and turned round

to face us, then, finding we were not coming on immediately, indulged in the luxury of a good roll, probably to refresh himself after his run.

The question now was how to get him out of the water and within reach of the lassos. There was one simple and very dangerous way of doing it—to induce him to charge. Without the slightest hesitation Jones tried this plan, riding right up to the water's edge. The rhino let him come on until he thought he was sure of getting him, then charged with lightning-like suddenness. It took the horseman all his time to keep ahead, but a few seconds later a lasso was over the great brute's neck, checking him momentarily, though immediately afterwards the rope snapped like a piece of thread.

Obviously there was no sense in trying to catch him that way when he was in full career. The only chance seemed to be to tire him out first and then endeavour to get several lassos on him at the same time. For over half an hour the three cowboys kept up the game, taking it in turns to be chased, the rhino always returning to the pool after each unsuccessful dash. At last another rope was thrown, and this time he was caught round one of his hind legs. The lasso held, but the man and the horse at the other end had to follow the animal when he decided to leave his pool and take up his stand in what was happily a most convenient place for me—the middle of an open space. His first act then was to knock down an ant-hill which seemed to annoy him, and after venting his wrath on that he was ready to face us once more.

I sent my assistant to a small thorn tree on the south side, taking up my own position opposite. Hardly had I done so when the rhino caught sight of my assistant's camera and charged. His carrier-boy gave a fearsome yell and was up the tree long before the white man, but, luckily

for the latter, the rhino paused to smash up the apparatus, otherwise I should have got a moving picture of my assistant being tossed, a picture which in all probability he himself would never have lived to see on the screen.

Means saved the situation by dashing in just as the great brute had finished with the tripod and inducing him to chase the horse. In an instant my unfortunate assistant seemed to be forgotten, and the animal was in pursuit of Means.

The beginning of that fight was typical of the whole. If the men and horses were good, the rhino was splendid. He was game right through, and despite their wonderful skill, the cowboys had their work cut out. They lassoed him time after time, throwing their nooses over him with uncanny accuracy; yet he would either tow man and horse away across the veldt or the rope would break. I do not know how many broken lines were dangling from him when at the end of some four and a half hours he began to show signs of exhaustion. Several times one or other of the Americans managed to seize the end of a broken rope and tie it on to another, but it seldom held for long.

It was exhausting work for all concerned, but especially for the horses. They had, of course, by far the worst of it. Their riders had the excitement to keep them going, still I think the horses enjoyed it. My assistant, who was on his first visit to Africa, I placed within a couple of yards of a tree, up which he could shin, which he luckily did when things became dangerous. I was on foot, and had the rhino concentrated his attention upon me, he would inevitably have succeeded in ridding himself of an enemy. Yet during the whole of that long afternoon's excitement I do not recall having thought of this. I was out then to get photographs; I had gone to an immense amount of trouble to secure pictures of that

rhino being lassoed, and I was not going to be done out of my reward if I could help it.

The sun was getting perilously near the horizon, when Jones decided to try and make the animal fast to a tree. Loveless got him on the run again, leading him straight down on to my camera, though fortunately he pulled up in time. Obviously he was getting played out by now. One of the broken ropes was caught, another was thrown catching his hind leg, then gradually and with infinite exertion he was tied to a thorn tree, round the trunk of which the lasso was passed. Just before he was finally tied up he drove Loveless up a tree, but that was his last effort. He stood there a gallant, sullen captive, the real hero of the act, whilst I used the last of my film on him.

When we visited the place next morning he had gone. I met a man who saw the same rhino with a bit of rope on his head, and directly he got the smell of a white man he was off like lightning.

After the lassoing of the rhino there came another blank. We wanted a lion now. One day I sighted two against a hot spring over a mile away. There were a few rocks in the background. When we got to the place the lions had vanished completely, but one had left the biggest pug-mark I had ever seen. Everything else had to give way to the search for lions, yet none was sighted. Day after day it was the same, and with each hour our chances of success grew less. Stores were shrinking rapidly, a sense of discouragement was spreading through the whole party, and the real rains which would make the country almost impassable for the wagons became more and more of a danger to the expedition.

At last, after a camp-fire council, we decided to accept the inevitable and head back for Nairobi. There was a

chance, of course, of a lion on the homeward journey, but I believe none of us really counted on it. We hurried over the road—if you can use that term in connection with bullock-wagons. We wanted to get away from the dreary, waterless country we had been scouring in vain. There was one long stretch, a twenty-four-hour trek, between two water-holes, and we gave the cattle a day's rest before tackling it; then we inspanned in the cool of the evening and started out on what we knew must be a wearisome ordeal. At sunrise we were in the Rift Valley again; at noon we halted for a couple of hours and served out water sparingly to the horses and carriers. The heat was abominable; everyone was horribly thirsty, yet it was out of the question to make a real stop. The cattle must be got on to the next water-hole.

It was a dreary-looking procession that wound along the road that afternoon. The carriers were too thirsty to chatter to one another, much less to sing; the white men were too parched to smoke. Horses and cattle alike plodded along with drooping heads. Everyone was longing for the trek to be over, longing for the moment when he should be able to throw himself down beside that water-hole ahead and forget—or try to forget—that abominable dry stretch.

And when at last we did reach the supposed pool there was not a drop of water in it!

There was now only one thing to do. Scores of lions might have been but a few miles off the track, yet we should not have dared to turn aside in pursuit of them. When you are short of water on the veldt every other consideration has to be forgotten. Water comes first, far before food, far before photographs, for it may mean life or death to the whole party. With a big safari like

ours one dares take no risks of thirst.

So when darkness fell the expedition was on the march again, heading now for Kijabe Station, where water was a certainty, leaving Jones, the two cowboys and myself on the ground for the night, as we wanted one final look for lions. In the morning Jones left us, so we took a sweep round in the direction of the Rugged Rocks. I found the beasts—a lion and a lioness—at the very time when I was not ready to do anything with them!

We discovered them amongst some volcanic rocks at the foot of the Longonot Volcano, and succeeded in holding them up for some time, but the picture outfit had gone on. It was a pity that Ulyate, our white hunter, was not with us; but when we rejoined him at Kijabe about midday and asked his opinion he said that very likely they lived there regularly, and that we should stand a good chance of finding them again.

Naturally, I was anxious to return as quickly as possible. There was no water at the Rugged Rocks, but after the cattle had had a rest and a feed we could refill our tanks and work off them. Unfortunately, however, there were other considerations which made the plan unworkable. The two cowboys were on the sick list, and could barely sit their horses. All the animals were tired out as a result of the long, waterless treks, and, moreover, it was a matter of urgent necessity for me to get the films I had already taken developed. So most reluctantly I gave up the idea for the present, and, leaving the safari to recruit its strength at Kijabe, I went down the line to Nairobi to do my developing and see about procuring fresh supplies.

Five days later I was back, to find that the dreaded rains had not come, and that the rest, short though it had been, had done all hands a great deal of good. That

same night we loaded up the wagons, one with general stores, the other with the water tanks. At the first streak of dawn, as soon as it was possible to see the ground, we trekked out. There was no road of any sort, not even a cart-spoor going out in the direction we wanted to take; but still, as the veldt was more or less open, there was not a great amount of chasing to be done. A lightly-laden bullock-wagon can go almost anywhere, and what we were carrying was very different from the one-thousand-pound weight which is the transport-rider's "full load."

The spot for which we were making was not exactly an inspiring one. Locally it is known as the Black Reef. It consists really of a ridge, some two hundred feet high in places formed by a stream of lava which in long bygone days had run down from the crater of Longonot Mountain. If the lion prefers a dreary home he can certainly satisfy his desires there. The bush is nowhere thick, but at the same time there is plenty of cover in the form of scrub and the inevitable thorn trees.

That evening, while the wagons were coming up, we scouted round, but though we found plenty of game spoor, we saw no fresh signs of lions. One of the cowboys, however, shot a rhino which had charged him.

In the morning the hunters were out early, but they had no luck of any kind. Game in plenty, yet not a sign of lions—one and all made the same report. Meanwhile the wagons had gone back to fetch more water, and also to give the cattle a chance of drinking. Now that the track was made it was possible for them to do the double journey in a day—no small consideration for us in the circumstances.

The second day after our arrival we decided to try the other side of the ridge. The rhino which the cowboy had shot had been left there, and it was just possible that

the carcase had attracted some lions, who after gorging themselves on it might be sleeping off the effects in the scrub. Consequently, we arranged for Jones to work round a mile range from one end of the reef, the two other cowboys to take the other end, whilst Ulyate and myself scaled the rise and kept a look-out for the signals which were to tell us if a lion had been sighted.

It was still dark when, after having left the cameras at the foot of the ridge, we climbed up to the place agreed upon. It was cold, of course, and I was glad enough of my coat, though I knew that in all probability in two hours' time the perspiration would be pouring down my face.

The sun rose in a cloudless sky. We could see for miles across the veldt, and had we been there for nothing else, it would really have been worth while to have climbed up to get that view. But it was not long before we had something else, something far more urgent, to occupy our thoughts. In the open veldt below us was a horseman, Jones, with the dogs, and he was evidently hot on the spoor of something. Ulyate declared that it must be either a lion or a hyena.

A few minutes later they were almost at the foot of the ridge, and we had begun to clamber down towards them, after having lit a signal fire to call up the other members of the party. Yet, though we had wasted no time, both horseman and dogs were out of sight by the time we reached the level ground. Then from round a small rock came the reports of a couple of shots, followed a moment later by the fearful roar of a lion, and after that by the barking of dogs. At last we had found what we had been seeking for so long.

Ulyate had hurried on ahead, but he was soon back with the news. There was a lioness in the bush, with

the pack of seven dogs, each of a different breed, round her—everyone who has read those wonderful books by that greatest of hunters, Mr. F. C. Selous, will remember the use he made of such dogs for lion-hunting—whilst Jones was waiting for a chance to get his lasso over her. She was still there when the two other cowboys came up, and I got within twenty yards of her with the camera. We had hardly begun to discuss what our next move should be when she settled the question for us.

Like a flash she came out, heedless of the dogs now, and made her way to an opening in the rocks, where she stood at bay. It was impossible to get the horses near her, impossible to do anything save shoot her, whilst she was on that broken ground; and I had not taken all that trouble, spent all those weary days, in order to see a lioness killed with a bullet.

By various means—firing the grass, throwing crackers, setting the dogs on—we managed to make her move several times, but though I got one or two scraps of film at close quarters, I wanted far more than that. The heat soon became intense, overpowering, and it was only too plain that the dogs were beginning to tire. The dust, the sun, the continual barking were too much for them.

At last, in sheer desperation, Jones declared that he would try and slip a noose over her by means of a pole. It would have been risky, for had she sprung at him Ulyate's bullet would probably have failed to stop her in time; but just at that moment she changed her tactics. Without the slightest warning she sprang down the rocks, raced across the veldt and stood again amongst some scrub on the bank of a small spruit. The dogs had followed her gamely, and now, despite their exhaustion, they bayed her once more. She too was tired moreover, she

was in that state of exasperation in which, with one of her kind, anything is possible.

She had taken up her position cleverly, her rear and to a certain extent her flanks too, being protected by the spruit. The men with the lassos could only approach her in front.

Fortunately, she gave me time to get my camera fixed, in fact I was able to pick out a good background; but the grass was too long to show much of her body whilst she crouched there snarling her hardest.

Then Means worked forward, his rope ready; but before he could throw it she seemed to realise her danger. With mouth open and an awful roar she was at him. For a moment it was touch and go whether he could avoid her, but he managed to gain a few yards. Instantly she saw that the first man had escaped she swung round and directed her attention on Jones, but he too evaded her. In savage disgust, she abandoned those tactics, and once more took up her position at the foot of a thorn tree. All this time I had been turning the handle of my machine recording the whole incident, which had taken place only some eighteen yards away, on the film. It was an amazing opportunity, and I was well repaid for all the previous disappointments.

Though no rope was on her, yet a good deal had been gained, for she was in a far better position for lassoing. Jones kept her occupied by shouting and swinging his rope, whilst Means worked up for a throw. The noose fell fairly over her neck; but she seemed to realise her danger, and with marvellous rapidity slipped the lasso off. Now it was Loveless's turn. He caught her; once more she freed herself. By this time she was evidently alarmed as well as furious, for she suddenly dived into the spruit and took shelter amongst the bush. For a few

minutes it seemed as if she was destined to beat us after all. The grass was fired and crackers thrown in without result; but at last she showed herself sufficiently to allow Loveless to have another throw. As he did so she seemed to divine that he was the immediate enemy, and sprang, just missing him. Then she was back in the spruit once more amongst the grass.

It was here that we finally got her. Whilst I brought my camera up to within twenty yards Loveless threw his rope so that the noose rested on the grass above her head, while he passed the other end over the branch of a thorn tree. Then, as coolly as though he were trying to catch a sheep, Jones went forward, a long stick in his hand, and from the bank above pushed the noose down on the lioness.

Naturally she sprang at him, but was caught by the noose, and after one of the most exciting struggles that white men were ever engaged in with a savage beast, she was captured, caged, and sent to the Bronx Park Zoological Gardens, New York. It was a unique and wonderful piece of work, requiring unstinted skill and pluck on the part of the cowboys.

This was the only animal we did not release after capture. It was kept to prove the power of man over wild animals, even although he may be armed with nothing more formidable than a piece of hemp.

2. IN A PERSIAN OIL FIELD.

Thus far we have described what may be regarded as the more strictly scientific side of the development of a particular oil field. Before we attempt to appreciate what the Anglo-Persian Oil Company has done on the human and sociological side, let us glance at the larger aspects and broader policies of the petroleum industry as a whole, considered as a unit in the world's economy.

It should be acknowledged here that what follows in this chapter is based mainly, indeed, almost wholly, upon an address delivered by Sir John Cadman, before the American Petroleum Institute, at Chicago, in December, 1928. The address was subsequently published under the title, "Petroleum Problems Outside the United States," though it was essentially a pronouncement and an appeal in the higher statesmanship of the oil industry regarded as a world industry. It has seemed to the writer that an outline at least, of the broad issues raised in that address is a necessary complement to this study of scientific and industrial development in a particular oil field, if the reader is to be helped to see the Anglo-Persian achievement in proper perspective.

What are these larger problems that are engaging the anxious attention of the world's leaders in the petroleum industry? Broadly speaking, they are concerned with the general principles that ought to influence and govern future programmes for control and distribution of the world's oil resources.

The world's reserves of oil are undetermined and

perhaps undeterminable ; but it is probable that, as in the case of the coal reserves of our own country, successive careful estimates will put the total figure ever higher. For example, whereas in the years 1920 to 1922 some reputable technical and geological opinion in the United States put the virtual exhaustion of the United States' oil resources within a period of twenty or thirty years, an eminent authority at the Fuel and Power Conferences, held in London in 1928, estimated the number of years upon which the world could rely for gasoline as high as 3,000. Still the geologists and the geophysicists go exploring the surface and crust of the earth in quenchless quest for a commodity which has now become one of the essentials of modern civilised life, moulding and modifying our industrial structure and even our social habits, just as coal and steam helped to fashion the industrial and social fabric of the civilization of the nineteenth century.

If, however, in certain economic reactions, more especially in relation to the laws of supply and demand, we compare, on the one hand, oil with, on the other hand, such common necessities as food, clothing and houses, some significant differences become apparent. In regard to these latter three commodities increase of supply, whether in home production or in imports, does not increase consumption and enhance demand beyond a certain point. In any given community when the ill-fed, the ill-clad and the homeless have had their needs adequately met in the matters of food, clothing and houses, the mere expansion of supply, accompanied by a fall in price, of these commodities is powerless to increase the demand for them beyond certain narrow limits; for the simple reason that individual human beings cannot extend indefinitely their consumption of food, their use of clothes or

their occupation of houses.

There is also another general factor operative in regulating production, namely, the relationship between the value to the user of the thing produced and the expenditure of human energy demanded by its production. The supply of food, clothing and shelter involves a fairly regular cost of human effort for the large as for the small unit. A loaf of bread, a suit of clothes, a house—each represents a fairly definite number of units of human energy spent in its production. Any significant increase in demand for these commodities is necessarily slow; it calls for an approximately corresponding increase in human effort to meet it; and thus a prompt check is imposed upon real over-production.

But in regard to oil the measure of human energy necessary to produce a definite quantity of it varies irregularly within wide limits. For example, the then Chairman of the Anglo-Persian Oil Company in 1926 explained to the shareholders that "to secure the production of crude required for export all that has to be done now is to open the necessary number of valves, by means of which the production of crude can from day to day or from hour to hour be regulated to our requirements to a nicety, just as regularly and accurately as when one turns on the water for one's bath." You call for more wheat and the farmer has to plough, sow and reap correspondingly increased acreage. You call for more crude oil and the engineer opens another valve.

On the one hand, therefore, in regard to the three common necessities of life we have chosen for comparison, their very nature in relation to human nature, and the fact that to increase the sum of their production needs a regular amount of added human effort, together constitute an automatic check upon really excessive production. On

the other hand, when we consider oil, it is, as Sir John Cadman says, "a fact of the first importance that the face of the globe is now drenched with a commodity which, although necessary to life, involves but an irregular and sometimes meagre expenditure of life in its primary production." Furthermore, it exhibits an economic characteristic that is novel—almost unique: the supply not only stimulates the demand, within limits it creates it. New uses spring up for it overnight. There is thus a peculiar economic stimulus to production tending directly to over-production with all its attendant evils—"so resilient appears to be the demand, so far remote the industrial saturation point."

The increase in the world's production is, however, not solely due to this peculiar economic stimulus. Improved geological methods, supplemented by those modern geophysical methods we have outlined in an earlier chapter, have led to the discovery of new oil fields in territories formerly considered to offer little hope. The advance in drilling technique has resulted in a saving of time and the working of strata previously deemed inaccessible, so that there has been an accelerated and more intensive working of the existing oil fields. Improvements in refining methods have resulted in a greater net product from a given quantity of the crude oil. The effects of all these stimuli to production have been most marked in the United States. Taking a survey of the six years 1922 to 1927 in all the producing countries of the world, other than the United States, production increased to the relatively small extent of some seven and a half million tons; whereas the increase in the United States in the same period was no less than forty-seven million tons.

Among the evil consequences of profligate production are premature exhaustion, both material and economic, of

discovered fields, and economic instability of the industry as a whole.

With regard to the first consequence, exhaustion, it is worth notice that in the Persian oil field the Company has had sole control and has been able to operate the area as, more or less, a unit field (or, at least, as an area of a few co-ordinated units), undisturbed by the competitive chaos that has characterised certain other oil fields. Furthermore, the comprehensive scientific data that have been obtained by the methods indicated in previous chapters have enabled a far-sighted policy of scientific conservation to be adopted and applied, continuously and systematically. Otherwise, despite the extraordinary richness of the Persian field, exhaustion of an economic, if not of a material, character would have been reached in a comparatively small number of years.

As to the second consequence, economic instability, it affects producer and consumer alike. "In the long run," says Sir John Cadman, "it profits nobody that there should be alternate waves of over-production and under-production, of high prices and low prices, of big profits and of little or no profits." In the Report for 1928 of the Royal Dutch Company for the Working of Petroleum Wells in the Netherlands Indies the same point is emphasised by Sir Henri Deterding, the Managing Director of the Royal Dutch Shell interests: "During the period of over-production and low prices amounts of capital have to be invested by the industry in order to deal with the large quantities produced; large stocks which cannot be consumed have to be stored in expensive tanks, whereas the earth is a much cheaper and safer storage. When this is followed by a period of small production a great many of the plants become no longer necessary and the capital invested therein is wasted. The same applies to the consumers: first they

will adjust themselves to the excessive supply of oil, which necessarily involves capital expenditure also for them, and when the period of low prices is followed by one of high prices they, too, will find that they have expended capital uselessly."

In the United States, too, there is a realistic appreciation of the need to stop the economic waste of world over-production, which, as Sir John Cadman says, "amounts to a robbing of the birthright of future generations." A comprehensive programme for curtailment of crude petroleum production in the Western Hemisphere has been recommended by the General Committee of the American Petroleum Institute on World Production and Consumption of Petroleum and its Products, and has been endorsed by the board of directors of the Institute. With so many interests involved it is obvious that the process of rationalisation of the industry must be a slow business, but an earnest beginning has been made. In April, 1929, all parties interested throughout the world were called to a conference in New York to see what can be done to secure a rational, stabilised and economic production in the principal oil-producing countries of the world.

We cannot within the limits of a single chapter, and with regard to the scope of this book, go far into the suggested lines of advance, but certain considerations may be briefly summarised. In the first place there is the need of some recognisable and acceptable policy governing the extent of storage facilities. Sir John Cadman suggests, as a guiding principle, "the desirability of conserving deposits, once discovered, not in imperfect containers constructed on the surface of the earth, but, so far as is practicable, in that great and perfect reservoir which Nature herself has provided." Allied to this is the evil of the unlimited multiplication of facilities for the so-

called "service" of the motorist. There is need, economic need, in the interests of producers and consumers alike, to abate the nuisance of excess and to attain some sane equilibrium between service and supply.

Again, in the realm of transportation by sea there are countless instances of waste of strength through lack of co-ordination and by straining against the facts of geography. For example American oil finds its way to India and Persian oil to Iceland. We need "a sane 'economic' of the sea," and this involves the problem of finding for every market the "nearest source of supply"—that is to say, the nearest, taking account of all relevant economic factors, for geographical propinquity is not the only economic factor to be considered here.

Finally, there are the problems having their origin in "the vivid sense of nationalism which, during the last ten years, has acquired acuteness and strength in many countries." It is natural for the government and people of any country in which large deposits of oil have been found to regard their possession jealously and to think of it in merely national terms. But in a country of small consumptive power the mere possession of natural oil is an asset only in so far as a whole complex of external conditions—financial, technical, distributive—makes it so. As Sir John Cadman well says, "without hundreds of investors willing to lose four times out of five in the hope that at the fifth they will make good their losses; without the instruction of a whole faculty of technical resources, founded and developed in other countries—or, it may be, in another hemisphere; without an army of pioneers who have adjusted the needs of man to the character of the product and *vice versa*; without a network of distributive systems having been traced upon the face of the globe—without every one of these things,

the oil deposits, priceless as they are potentially, might just as well have been buried deeply in the moon." He therefore, pleads for "a sane nationalism; regarding oil neither as a heady intoxicant for oneself nor as a deadly drug for one's political competitors, but rather as a store of energy to be conserved, released and applied as part of a concerted operation owing its inception to more than one nation and therefore yielding its tribute to more than one treasury." And this sane nationalism needs as its complement a corresponding policy of "sane and honest internationalism in industry," involving frank co-operation between national and international forces.

Such are some of the leading problems of the petroleum industry which have suggested the challenging title of this chapter: "Oil and Ethics." If it be objected that they savour rather of economics, we may perhaps recall the saying of the cynic: "Show me that a course is economically expedient and I'll soon find you moral sanction for it." There is less of cynicism in the saying than appears on the surface. It is good ethics to instil and practise sound economics. The old gibe at economics as a soulless science has led too frequently to the assumption by ardent propagandists that there is some inherent antagonism between economic and ethical action. It will not be the least valuable service that the world's leaders of the petroleum industry will render if, by their concerted efforts to secure a rational world production of oil, they expose the mischievous fallacy of this assumption.

Before bringing this study in scientific and industrial development to a conclusion, an attempt should be made to summarise briefly some of the conspicuous economic and social benefits that have accrued to Persia through the operations conducted in that country, by the Anglo-Persian Oil Company.

The economic and social advantages ensuing from the provision made, and described in the preceding pages, for the health, housing, education and training of the Persians need no elaboration. It is enough to say that to improve the health, to increase the industrial efficiency and to raise the standard of comfort of a large section of the working population of any country are, perhaps, the most valuable and permanent forms in which contributions can be made to the real wealth of the country.

But there are other economic benefits to Persia, directly attributable to the work of the Company, such as, for example: improved transport facilities by road making and other means, the direct revenue paid to the Persian Government by way of royalties, as well as contributions to local authorities for appropriate services; the creation of increased spending power by the distribution of a large wages fund; and the stimulation of production and the increase in volume and variety of the imports into Persia in order to meet enlarged demands for commodities. All these benefits are the tangible and intangible results of the work of the Anglo-Persian Oil Company in exporting from Persia the crude oil found beneath the surface and the refined products obtained from it. We may glance only cursorily at these factors.

No one who has visited the Middle East and seen the ceaseless caravans of asses, mules or camels, carrying their heavy loads over the desert or through the defiles of the hills, along rough tracks made only by the feet of countless, similar caravans through the ages, can fail to realise what an economic boon is a solid, unquestionable road. The Company has constructed in Persia no less than 1,600 miles of roads. Many, perhaps most, of the Company's roads are among the twisted, crumpled foot-hills to which reference has been made and the construc-

tion of properly graded roads on such a terrain has called for great engineering skill and an enormous use of labour. The roads had to be made fit to bear heavy traffic and this has necessarily involved the building of numerous bridges. The road from Fields to Dar-i-Khazineh, for example, some thirty-six miles long, passes for the greater part of this distance through the Tembi valley, which is for long lengths a deep gorge; and the road has been blasted out of the steep sides of the gorge and crosses the river by several bridges. The Company employs, directly or through contract, some 4,000 Persians who are engaged constantly in making or maintaining roads.

Besides the road from Dar-i-Khazineh to Fields, a railway of $2\frac{1}{2}$ feet gauge was constructed by the Company and opened in 1923. It follows also the Tembi valley and crosses the river by numerous bridges. Along this railway from 3,000 to 4,000 tons of material per month are transported, and the distribution of materials from the rail-river head, by road and railway combined, amounts to no less than 7,000 tons per month. Passengers are carried along the railway by means of a "Drewry" car —a sort of open-sided, single-deck, tram car, driven by a petrol motor built into the chassis.

It is true that the main function of these roads is to serve the transport needs of the Anglo-Persian Oil Company, and that, apart from the employees of the Company, there is no considerable local population, settled near the roads, to which they can be of great use. But they are generally available to all and are used to some extent by Persian non-employees. In any case, they constitute a valuable addition to the material assets of the country, both actually and potentially. Not only so, but by their very existence they provide an object lesson and an incentive to other areas, which may lead in time to improved

road making and transport facilities in other parts of Persia.

The organisation and the control of the varied traffic along these roads is no light undertaking. For example, the total Fields transport fleet, including lorries and cars, is 467 vehicles; and for the whole of the transport operations in Fields area, taking into account the cars and lorries entering from other areas, approximately, 1,000 vehicles are used. There are similar transport fleets at Ahwaz and Abadan. It is worth notice that the motor lorries are equipped with a special device, called a "Controlograph," whereby there is automatically recorded, on a circular paper dial, the time taken, the speed, the rest periods and the distance covered for each journey of the lorry. The value of such a record for checking waste, loitering, furious driving and misuse is obvious.

The drivers of the cars and motor lorries are mainly Persians, including Arab and Armenian subjects of Persia, and most of them have been trained to their work by the Company. At Ahwaz, which is roughly the half-way house between Fields and Abadan, there is a great motor repair and overhaul shop where the cars and lorries are periodically "vetted" and put into working trim.

Incidentally it may be mentioned that in the busy area of Fields itself and also at Abadan the road traffic is controlled by Atashkaries, after the manner of the City police near the Mansion House in London. These Atashkaries, it should be explained, are Persian firemen, members of the Company's efficient fire-brigade, and are trained under a European chief officer who was formerly chief of the fire-brigade of an English borough. They wear a khaki uniform, with "shorts," and have a passion for saluting with the smartness of a British guardsman. There is even, in the centre of Maidan-i-Naftun, that most

modern development, one-way traffic—maybe along the line of the very mule track that Alexander the Great traversed on his invasion of India. Such is the progress of the centuries.

In connection with transport, mention should also be made of the fleet of shallow-draught, stern-wheel paddle steamers that ply on the Karun river between Abadan and Dar-i-Khazineh and are the main means of transporting the heavy materials imported at Abadan and needed at Fields. It was explained that at Ahwaz, on the river Karun, some 114 miles by river from Abadan, there is a series of rapids. The Company has, therefore, to maintain two fleets of these boats, one to work the lower reach of the Karun river from Abadan to Ahwaz, the other to work the upper reach from above Ahwaz to Dar-i-Khazineh. The navigation of these steamers, which are oil-fired and draw only from three to five feet of water, needs care, for the Karun river winds and twists unceasingly through the desert, is subject to great fluctuations of flow, and is beset with mud banks in its course. In times of flood the river frequently overflows its banks into the desert around for miles, and it shifts its course from time to time so that landing stages constructed at chosen points may be rendered useless.

Lastly, to complete this outline of transport facilities, bare reference should be made to the fleet of tankers that come to Abadan to take the crude oil to the Company's refineries at Llandarcy, South Wales, and Grangemouth, Scotland, and refined products to various distributing centres all over the world. The tanker fleet now consists of eighty-six ships (seventy-eight in commission and eight building) of 782,000 dead weight tonnage, which combine all the modern improvements of this type of ship. To enable the largest of these tankers to be fully loaded at

Bawarda, the new channel has been dredged, at the Company's expense, through the Bar of the Shatt al Arab on the head of the Persian Gulf.

It may be convenient to interpolate here a brief description of what the Company has done in the way of developing means for the rapid and reliable communication of information between its scattered operating units. With vessels entering and leaving Abadan at the rate of ten per day, with exploratory tests being conducted in remote parts of Persia, and with the long pipe-lines connecting the producing fields with the refinery, it will be obvious to the reader that reliable and speedy means of conveying information is a vital necessity. The Company has, therefore, developed an extensive system of telephones, telegraphy and wireless stations. There are two main wireless stations, one at Masjid-i-Sulaiman and the other at Abadan, supplemented by five wireless installations, of shorter range, at other locations. These smaller stations are in touch with the one or the other of the two main stations and thus a message from any one can reach (by being relayed, if necessary) any other station. There are no less than 375 pole miles of the telephone and telegraph system in constant use, the number of miles of telephone and telegraph wire needed to complete the service being at least six times the pole mileage.

In the case of the pipe lines, for example, that carry continuously, day and night, the crude oil from the wells to the refinery, communication by telephone and telegraph must be maintained between these centres and the pumping stations, for a break in the pipe line or an accident in a pumping station might involve a serious loss of oil, unless instructions could be issued immediately to cease pumping and to effect the necessary repairs. Messages are passing continuously over the telephone and telegraph lines, record-

ing pressures, tank depths, temperatures and a hundred and one technical details, all of the utmost importance to the engineers responsible for the throughput. No patient in a hospital has such attention given to every throb and pulse beat as has this vital line. Without telephone and telegraph systems maintained in a high state of efficiency, the main pipe-line would be really more difficult to operate than would a railway at home without its telephonic and telegraphic signalling systems.

Again, in the course of testing the oil resources of the country, wells are sunk in far distant and almost inaccessible districts, with which continuous communication must be secured. The configuration, and at times the unsettled conditions, of the region between headquarters and these outlying test areas is such that land telegraph lines could be maintained only at prohibitive cost. The Company has taken full advantage of recent developments in radio science and has installed a system of wireless telephones and telegraphs which enables the prospectors in these test areas to communicate their needs to, and to receive instructions from, the principal wireless stations at the oil fields or at Abadan.

Similarly the long distance wireless station at Abadan—the greatest oil port of the East—enables the tankers at sea to communicate their due date at Abadan; berthing and loading instructions to be passed to the vessels while yet many miles away; and the pilots at the entrance of the Shatt al Arab to be warned in time. Thus, on reaching Abadan, the vessel comes without fuss or delay alongside her appointed wharf, where the shore staff are in readiness to connect the loading lines and hasten the vessel's despatch to distant shores with her cargo of 10,000 tons of oil.

The telephonic, telegraphic and wireless installations are just as essential elements of the Company's equipment

as are the pipe-lines, the pumps, the roads and the railway. They constitute, in a very real sense, the nervous system of this great industrial organism, by means of which the most distant parts are brought into instant and intimate touch with headquarters in Persia, and without which it would be impossible to co-ordinate to proper functioning the varied and scattered operations of the Company.

The direct contribution to the revenue of the Persian Government, paid in royalties from 1913 to 31st December, 1928, amounted to just over eight million pounds sterling, the payments for the twenty-one months ended 31st December, 1929, being estimated at about one and three-quarters of a million pounds. Since the total national revenue in 1926-27 amounted to a little more than $6\frac{1}{2}$ million pounds, it is obvious that such substantial payments must relieve the tax-payer in Persia of a considerable part of his tax burden.

In wages and local purchases the Anglo-Persian Oil Company pays out in cash in Persia some $2\frac{1}{2}$ million pounds sterling annually. The economic benefits of such a large wage distribution among the population cannot be confined to the wage receivers; the increased purchasing power spreads prosperity to the traders in the bazaars; it contributes its share to the general purchasing power of the nation as a whole; and it does something to stimulate production and to increase imports in order to meet the enlarged demands so created.

It may be of interest to note here that in order to guard against great fluctuations in the cost of living among the Persian workers, more especially fluctuations caused by wheat shortage, the Anglo-Persian Oil Company holds large reserves of wheat which can be unloaded on to the market when the price of that commodity rises so much as to be a real additional burden to the workers. In this

way not only can immediate distress be met but prices and wages are steadied, to the mutual advantage of employer and employed.

It is worthy of remark that the present enlightened Shah of Persia has visited a great part of the area of the Company's active operations in Persia and that, in December, 1926, a number of Cabinet Ministers of the Persian Government made a similar visit. There is good reason to believe that the Shah and his Government are alive to the economic and social benefits accruing to Persia and the Persians from this great industrial enterprise and that, in particular, they welcome the policy of the Company in seeking to increase the co-operation of Persian subjects in the varied operations of the Company.

In this connection it may be mentioned that it is the custom of the Company to issue in Persian the annual general report of the Company as well as Persian translations of other selected publications. In this way an intellectual interest is created and maintained among educated Persians in the progress and development of an industry of vital economic significance to their country. Nor does this intellectual *entente*, if it may be so called, end here. At home lectures are delivered from time to time before appropriate societies, and articles contributed to magazines and institutional journals, by officials of the Company, and notably by Sir John Cadman and Sir Arnold T. Wilson, on subjects relating to Persia, with the object of familiarising English audiences and readers with Persian achievements, ideas and aspirations. Apart from the inherent interest of lectures and articles of this sort, their psychological effect, there is reason to think, is not negligible.

Much more might be said, of course, were more space available, on the economic results of the activities in Persia

of the Anglo-Persian Oil Company. Enough has been said, perhaps, to make it not altogether a wild hope to entertain, that the record here given may help to dispel the notion, sometimes held and expressed at home, that the work of any great industrial undertaking can be dismissed airily under the contemptuous term of exploitation.

In the foregoing pages an attempt has been made to show broadly, without too much technical detail, the extent to which the Anglo-Persian Oil Company has applied, and is applying, scientific knowledge, research and methods to its activities, more especially in Persia. There are some outstanding features of this aspect of its work to which attention should now be directed.

In the first place it will have been recognised that the distinction often drawn between pure science and applied science has no practical significance in the determination of the Company's operations. To elucidate the scientific principles involved, to gain the scientific knowledge needed, and to apply the knowledge, in so far as it can be applied, to industrial practice, these aims are regarded as constituting essentially one problem and one purpose.

In the second place, science is not confined, as too often in industry it is, to a strictly limited technical area, nor is it regarded merely as the Hercules standing by to get the industrial wagon out of the rut. There are no limits set to the field in which science, or at least some of the methods of science, may be applied; and the scientist is adopted into the industrial family as a working member of the household, on equal footing with the other members, such as the business man, the financier or the administrator. It follows that the problems presenting themselves successively for solution are seen steadily and seen whole—to borrow Matthew Arnold's phrase—from a standpoint that includes the view of the man with the pick

and also the view of the man with the test-tube. The merging of these two outlooks and the co-operation of the corresponding personalities provide an example well worth study of how science can be well—perhaps best—assimilated into the industrial organism. It is of more than passing interest to note that this unreserved acceptance of the rôles of science and the scientist in industrial development culminated in the appointment to the Chairmanship of this great corporation, by the unanimous vote of his fellow Directors, of Sir John Cadman, whose previous experience combined that of a distinguished university professor with that of a mines manager familiar with the face of the coal seam.

Another notable feature that can hardly have escaped the reader's attention is the comprehensive character of many of the researches undertaken—for example, on the methods of oil finding; the study of pressures and levels; the problem of the gas; the correlation of investigations into engines and engine performances with those into the oil to be used in the engines; and the investigation of tropical and industrial diseases. It may possibly be argued, at first blush, that a company having the large financial resources of the Anglo-Persian Oil Company can well afford to take such a comprehensive view of research needs. Whatever truth there may be in such a contention, the argument fails to take into account how much these large financial resources are due to the general adoption of such a wide and far-seeing policy.

Such are some of the broader considerations that arise on a general survey of the more strictly scientific side of the Company's work. It is, however, impossible fitly to conclude this essay without a wider glance at what in effect the Company has done in Persia.

Before the Company came to Persia the area around

Masjid-i-Sulaiman was little else than a wilderness of crumpled hills, the loneliness of which was disturbed only by the wandering nomads or by the prowling hyenas and jackals. There were no roads. There were only mule tracks which the nomadic tribes with their flocks and herds traversed twice a year on their way to the growing grass. A few rude habitations provided shelter for the relatively few Persians that tilled the soil to be found here and there in favourable valleys and, having reaped their meagre crops, then moved on.

To-day, among these same treeless hills, over an area of about 200 square miles, there is a settled industrial population of some 30,000 souls, provided with all, or nearly all, the conveniences and amenities of western civilisation—good roads with motor transport; a light railway; electric light and power supply; pure water supply; natural gas; excellent housing accommodation, from the spacious bungalows for the higher British staff to the rows of solid houses for the Persian labourers; substantially built and sanitary bazaars, including bakery and baths; a more than well-equipped hospital; modern sanitation; skilled medical and surgical service; telegraph and telephone services; wireless station; fire brigade; schools and workshop training centres; clubs and a central hall for concerts and other entertainments; playing fields, tennis and racquets courts, golf links and—even—racecourses.

Dotted here and there in fields are the derricks which mark the spots whence is drawn from below that dark liquor, the crude oil, which is the very life blood and sustenance of this elaborate civilisation and also of the similar and larger community, a hundred and fifty miles away, at Abadan. Round about on the gaunt hills are the ever-burning, mighty flares, pillars of cloud by day and

gigantic torches by night, that witness to the enormous store of energy beneath this part of the earth's crust and themselves provide fresh problems of the conservation and use of this energy, problems which call for further sustained, scientifically directed, human effort.

A not less remarkable transformation has been effected at Abadan and Bawarda, on the island of Abadan, at the head of the Persian Gulf. Before the Anglo-Persian Oil Company began to construct its refinery here, the land was a waste patch of mud desert, breaking the continuity of the palm groves that line both sides of the Shatt al Arab from above Basra to near the bar of the Persian Gulf.

To-day there is a community of some 50,000 souls at Abadan, which has, excepting the railway, practically everything—and more—to be found at Fields and, when the writer was there in December, 1926, an expert botanist was studying the problem of the most suitable trees, shrubs and plants to be selected for the adornment of a public park already under construction. Abadan and Bawarda, moreover, form a great shipping port—"the Swansea of the East,"—with loading jetties, thrust out into the deep water of the Shatt al Arab, to which and from which come and go the great tankers of a mighty fleet, as well as the shallow-draught, river craft that ply on the home waters.

To watch the current of life flow and reflow, day by day, through these varied channels, and to reflect that but a few short years ago there was nothing at Fields but a hilly wilderness and at Abadan only a bare desert, is to realise what a great thing has been done for Persia, for Britain and for civilisation in this area of the Middle East. It is inspiring to remember that all these results have come from British enterprise, industrial organisation

and, not least of all, from the steady, persistent application, continuously directed from the head, of scientific knowledge and methods to the whole business of getting and refining a black liquid from the bowels of the earth.

The writer is not disposed to qualify the exalted view expressed to him that what the Anglo-Persian Oil Company has done in Persia is one of the finest achievements associated with the British name. It is a great game finely played, and the spectator must be dull who is not thrilled by it and apathetic if he does not feel, while watching the game, some longing to be a participator in it.

Corporations, it is said, have no souls. One might as well say that schools have no tone or that the spirit of a university is a meaningless phrase. It would be truer and better to say that every corporation has a soul, cramped or spacious, mean or generous, short-sighted or far-sighted, darkened or enlightened. The decisive test, as John Morley pointed out years ago in reference to nations, is the height and amplitude of the issues engaged and whether they are pursued intrepidly or "with creeping foot and blinking eye." The reader must judge how far the Anglo-Persian Oil Company comes to meet this exacting test.

3. AMERICA AND ENGLAND.

TO THE ROCKY MOUNTAINS.

We now leave the Mississippi, except in that its tributaries drain a large part of the huge State of Texas. This, the largest State in the Republic, is over 262,000 square miles in area: and it might be an empire in itself, so full is it of countless natural resources and things of material wealth, which its virile and enterprising people have exploited for their advancement.

The State was at one period an independent community, in the days of the 'Lone Star State,' which from 1836 to 1845, having thrown off the dominion of Spain and Mexico, flourished as a Republic. The history of the region in earlier times was marked by the great struggle between England, Spain, and France for the possession of America. The earliest explorers were Spaniards, the first settlers French, but the Spaniards became the possessors, and the ruins of the stone-built Franciscan Missions near the city of San Antonio mark their religious activities.

During the Spanish period, 1690 to 1821, there were 24 Spanish Governors in succession; eleven under the Mexicans, to 1836; and five under the independent Republic. The Spanish period left its stamp on the country, especially in the system of jurisprudence and in place-names. Texas has had a turbulent history, which has left its mark on the character of its folk to-day, and indeed the name has been synonymous often with matters of Mexican border feuds, private vendettas, the 'executive of the revolver,' the sheriff and his posse, the cowboy,

the outlaw, the cattle-thief, the lynching of negroes and others ; and all those elements generally associated with the 'Wild West'—locally designated the 'Wild and Woolly West.' But there have been many elements of progress in this interesting region.

We encounter here a wide diversity in the character of the landscape, from the mountainous western side of the State, to the enormous plains producing cereals, and also vast quantities of cotton : Texas having a large area under this staple than any other State. The vast cattle-ranges have rendered the State famous in respect of cattle-ranching, an occupation and pastime which drew many, and created much wealth. The considerable coast-line, on the Gulf of Mexico, displays a succession of curious, long, narrow islands, lagoons and peninsulas.

Originally, vast herds of bison roamed over the plains of Texas; and in the forests of long-leaved pine, wolves and bears were plentiful, but only a few of the larger fauna remain. There are alligators in the coastal rivers, and the rattlesnake is plentiful, as is also the deadly coral-snake, with other venomous reptiles whilst the tarantula and the scorpion are also uncomfortable creatures here. Being semi-tropical, the southern edge of the State has a varied fauna and flora, merging into that of Mexico, which lies across the Rio Grande and along the Gulf shores.

The southern boundary of Texas is of much interest as marking the frontier of the two dominant peoples of America; the Anglo-Americans and the Spanish-Americans, which roll together but never mingle. These two peoples still fear and despise each other to an unfortunate degree, and there is a legacy of hatred from the turbulent past which constantly asserts itself. The American professes to regard the Mexican as a 'greaser,' a low-caste

and ignorant folk, but this attitude, though it may be warranted as far as the lower class border Mexicans are concerned, cannot be substantiated when the Mexicans as a nation are considered, for the upper and governing classes of Mexico, and their capital cities and institutions possess a culture older and more refined than exists in Texas. The Mexicans, for their part, dislike the *Yanquis*—the Hispanized form of Yankee—as, in their view, an overbearing and upstart people, rude and uncultured, who, they allege, robbed them of an empire, in what they call the 'unjust war' of long ago. Both peoples, Mexicans and Texans, are brave and ruthless fighters, and have been guilty of excesses in the past. As for the Mexican guerilla leader and bandit, this type seems not to diminish, as the horrors of Mexican revolutionary warfare have proclaimed to the redoubtable President Diaz and to the present time. The Americans have many just causes for complaint with regard to their lawless neighbours.

The traveller in Texas will retain recollections of the bitter 'norther' or cold north winds. One moment he may be perspiring in the heat of the sun; the next chilled to the marrow by the suddenly uprising gale, often bringing with it choking dust-storms, which render life a burden to those out of doors, whilst they last. However, this must not be taken as typical of a climate which offers many advantages.

Texas was a slave State, and nearly a quarter of its 5,000,000 population are negroes or of negro descent, but the two races suffer from bitter antagonism, and dreadful occurrences are common as a result, in lynchings, burnings of negroes, attacks upon white women, and so forth, and the negro problem is one which must yet cause grave difficulties in this part of America.

We shall sojourn in San Antonio on our way from

New York to the city of Mexico, if by chance our journey lies to the beautiful Mexican capital, a thousand miles beyond the Rio Grande along the great plateau. San Antonio is a pleasing city, with its river, its plazas, or public squares—in large part, a legacy of the Spanish and Mexican style of town-planning; its old Mission buildings, and public buildings and institutions. It is the centre of a very extensive and productive farming and stock-raising region, with a correspondingly active population. The cathedral of San Fernando is the centre of the city, whose charter describes it as six miles square, its sides equi-distant, three miles from the cupola. The traveller will be shown the chapel of the Alamo Mission, around which terrible memories dwell. ‘Remember the Alamo!’—such was a war-cry of the Texans against the Mexicans. For, in 1836, against the heroic defence of the Americans, the Mexicans under Santa Anna—they numbered 4,000 against 200—after a bombardment lasting two weeks, overpowered the place, slaughtered the garrison and bayoneted the few survivors in cold blood, sparing only three women, two children and a negro servant. This piece of Mexican savagery has never been forgotten in Texas, and whatever may have been the character of the earlier Texan filibusters they would not for their part have been capable of such a deed.

And now the Rocky Mountains arise upon our horizon. We approach what geographically is termed the Cordilleran region of the United States—a term borrowed from Spanish topography, as in the Cordillera of the Andes. It is a vast mountain area, with intermediate plains, beginning upon the western border of the prairies we have crossed.

For long the blue line of these mountains has appeared above the horizon, but less tantalizingly than it was

revealed to the old-time immigrants, who in their slow wagons, with their household goods and families, made their adventurous and painful way westward, often lacking water, often in fear of their lives from the attacks of the savage Indians.

The Rocky Mountains begin in Northern Mexico, and grow wider and higher in the United States, and in Canada become still more stupendous. It is probable that the traveller who is accustomed perhaps to the scenery of the Alps or similar mountains will be disappointed upon his first view of the Rockies. They have not the Alpine sharpness of peak and ridge, ice-sculptured and lofty; their tops are rounded and slanting rather than pronounced; they are wanting in glaciers, their erosion has been less marked, and the forests upon their slopes are scanty, partly by reason of forest fires; and due to the fact that we view them from the considerable elevation of 5,000 or 6,000 feet altitude of the plains from which they rise their height does not so greatly impress itself upon the eye. However, the Rocky Mountains, in any case, are magnificent. Further north, in Canada, they have been described by enthusiastic writers as embodying 'Sixteen Switzerlands rolled into one.'

In Arizona and other States of the partly desert regions, upon which we now enter, there are many elements of marked beauty and curiosity. Among them are the remarkable rock-forms and the cactus vegetation, and, as regards this last, a special Department of National Botany, with a Desert Observatory and Laboratory, has of late years been established, to study and preserve this peculiar flora. This peculiar zone extends, of course, down into Mexico, where the desert vegetation, of weird cactus-forms, is perhaps the most marked feature of the landscape in certain districts. The atmosphere of this generally

arid region of the United States is wonderfully clear and stimulating, the views superb, the natural colouring most attractive. We may perhaps awaken to it suddenly, as the train makes its way through the desert, and from the comfort of our Pullman car bed behold it without effort through the window of the berth; perhaps with the red ball of the sun arising from behind the cruel-looking ranges on the horizon, casting shadows athwart the plain from the gaunt cacti which stretch their skinny arms abroad, whilst the shadowy figure of the coyote vanishes before the coming day.

Again, all day long, dreary areas of 'sand and sage-brush' form the landscape, often without any vestiges of human habitations. Here the horrible Apache had his home—cruellest and most bloodthirsty of any native Americans or perhaps other race. 'Yes, sir,' perhaps says the train conductor reflectively, as, his duties for the moment over, the train journeys steadily along to bring us to the land of Utah and the Mormons. 'Yes, siree'—still reflectively but authoritatively, as by one who would impart local information to the stranger, as in the comfort of the Pullman smoke-room we watch the changing landscape. 'Them Indians, the Apaches, were the worst of the lot. Many a white prospector or immigrant has been staked out alive by them on the plain, and after being mutilated left to die in the sun by inches, maybe on this very strip of desert we are passing.' The conductor of an American train is generally a good fellow, good with the amiability of the autocrat it may be, at times. In his leisure moments he has much interesting lore to impart, and other travellers joining in bring forward their quota of knowledge of men and affairs, and in such interesting converse the scenery may be lost for a time.

Texas, Arizona, Colorado and all other States around,

on to California, were characterized, in the development of their social life, by those attributes peculiar to the times and the environment. The 'West' was for long a synonym for adventurous lawlessness, for a system under which men were a law unto themselves, with what may be termed the 'executive of the revolver,' with each for himself as far as others would permit his pretensions, the final arbiter generally being the quickness with which the revolver could be drawn from the traditional hip-pocket and the 'drop' obtained on an opponent. The revolver was an American invention; the rapidity and accuracy of the 'six-shooter' and its mechanism was a child of the American brain, a result of the sensitive, nervy, and independent or resentful character, itself largely a psychological reaction from or result of the electrified environment; so different from that of the more sluggish European milieu. What the rapier was to the affronted gallant of mediaeval or even later times, in the Old World, the revolver was—and is—to the American. How many Americans carry revolvers to-day, even amid peaceful scenes and avocations, it would be hard to say, even in the Eastern States, but judging by the frequency with which the weapon figures in the Press and the police courts they must still be exceedingly numerous. It may be that the custom is increasing rather than diminishing. Even in England one might almost suspect that the weapon is more in evidence than formerly. But where the Englishman might settle his differences with his fists, or simply call the police, the American will whip out his revolver, and this argues both a different character and a far less advanced civilization. The American character, like the American weapon, blazes up and explodes with a touch, it might almost be said.

How many picturesque stories have there not been,

based upon this region, from those of Bret Harte upwards; a literature indeed *sui generis*. There was hard life, especially in the gold-mining settlements of California and Oregon, or in Colorado or Nevada, or in the cattle regions, especially Texas: hard drinking and gambling, the aggregation of outcasts from all over the world, desperate men who strove to build up some small wealth in a community where no question as to antecedents would be asked. Here among the mixed community arose a peculiar type of lawless individual, peculiar to Western America, known generically as a 'Bad Man.' This individual was a person of iron nerve; the nerve of the wild beast added to the natural intelligence of the human, who made his will law, dominated the particular small community into which chance had cast him, overawing by his sinister personality and absolute disregard of human life and coolness as concerned the risk of losing his own, a dead shot, with many deaths perhaps to his record. The 'Bad Man' generally had but a short reign, however, in any given locality. Often he was 'wiped out' by another 'bad man' who, having arrived from some other place, was driven by ambition or necessity to contest the established authority of his predecessor, and being a fraction of a second quicker on 'the drop,' resolved the question of supremacy, perhaps before the audience of the local 'saloon' or drinking bar, which institution generally constituted the Parliament of the locality. Or he may have been met by or fallen foul of the 'marshal,' as the local head of police—himself a person of tried courage and resource—is termed in those communities. Perhaps the marshal had ridden fast and far to do his duty, accompanied by his posse, and a sort of pitched battle may have been fought, in which one or the other was destined to fall. The psychology of these things was not without interest, and the day of this

picturesque desperado has come now to an end with more settled conditions, or practically so. He was a peculiarly American product; but—it is credibly recorded, that the 'Bad Man' of the West was very frequently born in the British Isles!

In the South-West, which we now enter upon, instead of woods and lakes, we have steely-blue mountains and arid deserts. Yet these same deserts and hills are interspersed with the most fascinating and romantic valleys, the most productive places, watered by the art of man, who has turned his irrigating stream from the mountain torrent, far across the wastes, to refresh what in reality are tracts of the most fertile soil, but which have lain fallow and abandoned until mankind, overflowing thereon from the East, found its uses.

In this distinctive region are the States of Arizona, Utah, Nevada, part of California, in the west, and part of New Mexico and Colorado, in the east and north respectively. It is the southern part of the great 'Cordilleran Region' to give it a wider nomenclature, in which, to the north, lie the States of Idaho and, in part, of Wyoming, Montana, Oregon, and Washington Territory.

The 'human geography' of this region of the South-West has been greatly influenced by the hydraulic work; the great reclamation works of irrigation, which have already been mentioned. Here the conquest of the desert has resulted upon this art, especially in Nevada, Utah, Colorado, and California. Men have cunningly built dams of cut stone or earthen banks across the gorges, enclosing great artificial lakes, which reflect the hillsides in their bosoms, where previously only the mirage lured the weary and thirsty traveller across the salty plain. There, where the cruel and bloodthirsty Indian roamed, or the luckless early settler strove to wring a living from the sun-baked

earth, flourish groves of fruit trees with handsome foliage and showers of golden fruit, and where, in the dry ravine, the hopeless wayfarer or parched beast sought vainly for water-spring or pool, the sound of rippling water-courses now falls upon the ear. Perhaps in all the romance of engineering none is found to equal that of the ancient art of irrigation, which, practised in the earliest times and by semi-barbarous nations, from Chaldea to Egypt and India —nay, by the ancient aborigines of America before the white man came—has been perfected by the ingenious Anglo-American here, in the arid South-West of the United States.

The State of Colorado deserves special mention in any descriptions of America, not because of its size, for it is not one of the largest, but by reason of its physical and other characteristics. The traveller who sojourns there will not readily forget the environment, the curiously beautiful structure of the country, where geology and erosion have played so remarkable a part, the unique topographical features, the fine, benignant climate, the variety of products of the vegetable and mineral worlds, the numerous fruits, the pleasing homes of the fruit-growers, and all else. In many respects Colorado is unique, and the desert has ‘blossomed like the rose’ in the literal translation of that term.

This region, which lies midway in North America between the oceans, is the summit of the continent, and like a backbone the Rocky Mountains traverse it, a Cordillera from whose craggy apex five great river systems flow, north, south, east, and west. These are: the Colorado, a remarkable stream, as later described, the Rio Grande, the Arkansas, and the North and South Platte, all supplied by the melting snows which lie above the now fertile plains, on the peaks and ridges which intercept the

clouds. Yet, far from the ocean, the sky is a generally cloudless one, and the clearness of the atmosphere and the coolness of the climate, despite the perennial sunshine, added to elevation, latitude and position combine to produce a very favourable environment.

The agricultural lands in this region lie at 4,000 to 8,000 feet above sea-level, and the remarkable fertility of the soil is due to the peculiar local topography. The soil produced by the disintegration of the rocks, lies as it was made in past geological ages, unexhausted by reason of the lack of vegetation. In humid lands rain and the consequent vegetation has drawn off much of soil fertility, but here there was no such agency at work, and the plant-food has remained intact, the mineral constituents of the rocks, as separated and comminuted by the glacier-mills of ages past. The glaciers departed, in their epoch leaving the brown and dusty soil in the valleys immediately beneath the hills unwashed by rain, which does not fall here, and when, very recently, man came he grew giant apples, full of flavour, and potatoes of the choicest that ever the earth brought forth, which are packed like apples in boxes and sent east to satisfy the appetites of the wealthy; also peaches, with pears, prunes, grapes, raspberries, strawberries, such as only these valleys, deep cut into the sheltering ribs of the eastern slope of the Rockies, with their meed of water and their sun, can produce. The absence of rain and the dryness of the climate help the orchardist to eliminate insect parasite, such as elsewhere work havoc, and the leaves and blossoms of the trees retain their protective poisons. Added to these conditions, the ingenuity of the Colorado orchardist

has equipped his fruit groves with orchard heaters,¹ so that his fruit blossoms do not fall a victim to early frosts, whilst the sun puts full colour into the fruit.

This climate, so favourable for fruit, is claimed as being ideal for the human organism, or at least so it is averred in Colorado. ‘The climate that is best for an apple or a peach is best for man or woman: here it soothes, stimulates and energizes all at once; and consumption, malaria, rheumatism, asthma, and many other ills that flesh is heir to will not abide here,’ say the good folk of this region.

Naturally, the inhabitants are experts and enthusiasts in the matter of irrigation, which they assert is far superior to natural rainfall. Irrigation, they say, is ‘the connecting link between the inexhaustible oil and the everlasting sunshine, reducing farming to a certainty, and giving a larger crop than rainfall can produce.’ The value of lands here of course depends upon water-rights and supply. Enormous outlay has been made, both by the Government and by private owners, on dams, reservoirs, tunnels, and flumes or aqueducts, to bring the water on to the land, and the system of water-rights has been equitably established. The amount of water needful to give the most beneficial results has been carefully studied; and the scientific tendency is towards employing less water and greater cultivation. The Colorado irrigationists affirm, and their *dicta* hold good of course in the surrounding States of the South-West, and in California, that irriga-

¹ These orchard heaters are small furnaces burning coal or oil, placed at intervals along the rows of fruit trees, and are kindled when the temperature falls. The cost is given—fuel and labour—at \$5 per acre per annum. The value of the crop may be \$800 to \$1,000 per acre, net. (\$5 = 13 rupees, approximately.)

tion is not a mere expedient for getting the ground wet because it will not rain, but that irrigation farming is an improvement in every way on farming by rainfall. Of course this favourable view is one born largely of necessity, but at least it embodies a truth in which the compensating laws of nature are at work. The grower here states that he can regulate the colour and texture of his fruit and vegetables, can keep his crops growing until they have attained their maximum by putting on or off the water, can make the wheat berries fill out by watering when the grain is 'in milk,' can keep his potatoes evenly moist and so free from all growing defects, also his onions (a famous crop here), drying them off into perfect keeping qualities when the proper moment comes. With regard to irrigated wheat, official figures are given in support of the advantages of irrigated versus non-irrigated districts, viz., 19 bushels to the acre as an average throughout the United States for the former, against 12 bushels for the latter and as to potatoes, 114 and 80 bushels respectively, and hay 2·16 tons against 1·16 tons per acre. With regard to wheat, the figures would not be conclusive when we consider the English average of 30 bushels to the acre, where irrigation is practically unknown.

Colorado's products include cattle, sheep and hogs, all fattened on irrigated alfalfa and pasture. A ready market for many of these products exists in the numerous small towns adjacent to the cultivated land; and thus we have the elements of self-supply.¹

¹ In this connexion, however, it seems rather remarkable that an effort is not made in England to apply irrigational methods. We frequently suffer disastrous periods of drought, during which an application of water to the ground should be very beneficial, whether to hay, roots, wheat, fruit or other crops. It is true that in England

Irrigation in Western America naturally exhausts the volume of the rivers. In Colorado, the Arkansas River—the valley is one of the most famous of the irrigated districts—dries up before crossing the State boundary, and thus the neighbouring State of Kansas is deprived of its benefits. Some years ago Kansas brought a suit against Colorado on this account, in the Supreme Court of the United States. Again, the exhaustion by irrigation of the Colorado River in Colorado has been a source of contention with Mexico, into which republic the river flows, first traversing part of Arizona and California. This exhaustion of rivers opens up curious questions of riparian rights, and might be a fruitful source of trouble, whether between the States of a republic or between neighbouring republics.

Of the grand scenery of Colorado and the adjacent States much is due to glaciation; sharpened peaks and alpine ridges, valley and troughs, cirques, glacier lakes, moraines, beautiful cascades, and the remarkable orographical features known as the 'parks,' which are great plateaux beneath the surrounding barriers of the mountain

we suffer often from an excess rather than a scarcity of rain; also that there is often an absence of any considerable volume of running water for irrigation, whilst irrigation works would be expensive. But, if the system were shown to be beneficial, as undoubtedly it would be in certain periods, these difficulties could be overcome; rain water could be stored in underground field tanks or by other methods, and the art of irrigation developed locally. At present it is represented by a few ancient water-meadows. However, the exigencies of the future will certainly force investigation of these matters on the rather unscientific mind of the British farmer and official. On various occasions the author has approached the Board of Agriculture with the proposal that investigation of the possibilities of irrigation in Britain should be made, but without more result than a stereotyped acknowledgment.

summits. Magnificent views, pleasing valleys, the clearest skies and a tonic atmosphere characterize this land. The region is well stocked with game. The gorges and canons of the rivers are often stupendous, but generally grand, and indeed are among the wonders of America, and description fails. The upturning of the rocks in this part of North America to form the Rocky Mountains at the margin of the great plains has developed an immensely interesting topography, and the weathering of hard and soft strata has wrought curiously grotesque rock-forms and fantastic shapes, such as are exemplified in the famous Garden of the Gods at the base of Pike's Peak. Weary immigrants in the past set their eyes day by day on these mountains, which, blue and elusive in the distance, formed their horizon as they toiled in white-tilted wagons 'over the plains' before the railways traversed the wilderness. Now the locomotive scales the most inaccessible places, crossing the passes at over 10,000 feet, serpentine along the walls of profound canons, forming 'loops' to gain elevation, and conducting us to the most airy places upon the roof, as it were, of Western America. Here indeed is vindicated the ingenuity of the American engineer.

A feature of the mountain landscape which we shall constantly observe is that of the curious heaps of rock which dot the slopes on every hand. They are the débris or dumps from innumerable mine-mouths, and look like gigantic ant-hills, whilst the openings seem like dormer windows on inaccessible precipices, opening out from the granite roof, thousands of feet above the track along which our Pullman car is being whirled. Colorado, indeed, like California, owes its colonization originally not to its soil, but to its minerals. There is enormous wealth of precious metals, of gold and silver, around which much romantic mining lore has gathered. There are precious stones, there

is lead, copper and iron in great deposits, there are enormous fields of coal. This coal lies in the stratified rocks of the great plains, the 'Parks' and the Plateaux which have been mentioned, of upper cretaceous age, and ranges from lignite to bituminous and anthracite. In 1864, 500 tons of coal were mined here, but now the output is many million tons per annum. Colorado is, for the west, what Pennsylvania is for the east, in this respect.

There is something peculiarly fascinating in this occurrence of great mining wealth in the desert, where, but two generations ago, we might picture only arid mountains dotted with sage-brush, the only living creature the coyote; trackless barren plains, and dry ravines. Then appears the figure of a solitary prospector, with his kit of humble appliances, chipping the rocks here and there, trying the soils, living on 'hard-tack' and the few things his limited pack will hold, hoping against hope, often poor and despised: and then comes the rich 'strike,' the generous lode of silver or gold-bearing ore, the feverish rush when the news, borne into the nearest camp, is known, the mushroom town that springs up, followed by the joint-stock company and the ponderous mill—with which last two items all elements of romance have fled! Also, the 'Magnate' enters, perhaps swallowing up individual genius and profits.

The prosperity of Denver—the 'Queen City of the Plains' as its admirers have termed it—is founded on the wealth of the rocks, the mining and smelting industries. Perhaps no town has had a more remarkable growth than this mining community, standing precisely a mile above the level of the sea, hard by the Rocky Mountains. Floods, strikes, outlawry, Indians, and all tribulations of the 'Wild West' have passed over it since the white man first set foot here in the middle of the last century, when

gold was discovered. To-day there are broad handsome streets, with some imposing buildings constructed of handsome stone of different colours which the local quarries furnish. The Auditorium, the Museums, and other public buildings are noteworthy, and the State Capitol is of native granite and marble. Schools, churches, theatres and so forth, with numerous manufactures, show what has been done in so relatively brief a space in the conquest of that once dreaded desert of the Far West.

In the Land of the Cliff Dwellers here is the romance of archaeology. Amid very peculiar scenery are 20,000 caves, once occupied by a prehistoric people, with thousands of communal buildings, some of over 1,200 rooms, all now in ruins, below the frowning precipices which overlook them; the only vestiges of the life of what must have been a busy people being fragments of pottery and textiles, unearthed from the tombs. Who were these ancient folk? From some remote source and unknown ancestry there grew up in the South-West of America, in ages past, a folk who had certain attributes of civilization and culture, who built stone buildings, practised various arts and irrigated the land by means of long canals. These bygone people, connected doubtless in some way with the ancient Toltecs and Aztecs of Mexico, had their being in the region where the boundaries of the States of Colorado, New Mexico, Utah and Arizona meet.

There are several groups of the ruins of the Cliff Dwellers, some of the most important of which are included in what is termed the Pajarito National Park, in New Mexico; the area having been made a public possession. There is also the Great Mesa Verde National Park, of the same character. The Mesa ruins are perhaps the most remarkable. The Mesa—the word is Spanish for ‘table-land’—has been cut through during the ages by the

Chaldea to Mexico—of the swastika; a good specimen of which exists in the Denver Museum.

New Mexico and Arizona are lands of promise whose characteristic and natural resources resemble those described for Colorado, in varying degree. Their history dates from the same period. The Spanish explorer Coronado may have passed hither in 1540, after the conquest of Mexico. The stamp of Spain, in place names, is encountered everywhere in the region, and has been wisely preserved and even extended by the Anglo-Saxon Americans: names which fall musically upon the ear, and certainly give pleasing variety to the map. The semi-Spanish environment has undoubtedly some influence on the folk to-day, with its mediæval touch, in the midst of all that is most modern. The admixture of names is curious. Here, for example, is a village called *Juanita*, and there is another called *Leeds*; or *Huerfano*—Spanish for ‘orphan’—and another *Whitewater*, and so forth. The valleys of Northern New Mexico—which State is not to be confounded with the Spanish-speaking republic of Mexico, which however borders on the South—are not unlike similar favoured spots in Colorado, and are watered by the Rio Grande and its tributaries mainly. Here we may enter villages established by the first Mexican settlers, with their adobe houses, arrayed round a central square, after the Spanish-American fashion inherited from Spain and the Moors; whilst the old Mission Churches, with rich exteriors, reflect the piety of the Spanish people; buildings far older and better preserved than the Californian Missions of similar origin. Here are very ancient vineyards, with gnarled and knotted vines centuries old, but still bringing forth their luscious fruit-clusters, and old orchards and stone-walled grain fields that have yielded their crops for hundreds of years. The Indian inhabitants

labour peaceably on their own small farms, or as workers on American farms, and their distinctive and picturesque dress adds to the local colour. Around the hot springs, of which there are a number, hotels have sprung up, for the use of those who take the waters—from whose benefits almost miraculous cures are claimed.

Santa Fé, the capital of New Mexico, has been a historical centre of some interest, and within the ancient church, worship has never ceased, we shall be told, from the time when its adobe walls were raised, over 300 years ago. It is a Catholic shrine, with its sacred images, and afforded both spiritual and material protection, having fortress-like walls. But modern life flows around it, and the amenities and conveniences of to-day are not wanting in this interesting State Capital.

Santa Fé, and indeed New Mexico as a whole, owes its early exploration to an old-world myth, for, early in the sixteenth century, it was fabled in Europe that strange cities and creatures existed in the region, of which there had been rumours for centuries. The legendary 'Seven Caves' of the Indian stories were magnified by the imaginative white men of the Conquest of Mexico into the famous 'Seven Cities,' and the Mexican viceroys sent thither explorers: one of which pioneers, catching a glimpse of the terraced community-houses of Zuni, of the Cave Dweller or Cliff Dweller folk, hastened back with the news that here indeed was an El Dorado, one of the 'Seven Cities.' Under the great Mexican Empire of Iturbide the region was a province, but in 1848 it fell to the United States, after the war with Mexico. To-day the numerous inhabitants of Spanish descent have now nearly become assimilated with the Americans, whilst the Indians, the Pueblo Indians, remain still more apart. The terraced architecture of these Indian villages is remarkable.

In the eastern part of the State lies the Llano Estacado, or Staked Plain, a vast arid tableland where nothing breaks the monotony. Some of the valleys are the curious *bolsones*, as the Spaniards termed them; basins without hydrographic outlet, with white alkaline floors, where, in a strange protective coloration scheme, even the reptiles and insects are often perfectly white. However, the rivers redeem the State from its desert character, such as the Rio Grande—the Nile of New Mexico—and others, and in the many fertile districts the considerable modern population dwells in comfort and luxury. In some districts the newer agricultural development of 'dry' or scientific farming is carried out. This system of cultivation consists, as generally known, in the main in an intensive tillage of the soil with the purpose of conserving the moisture.

Arizona is a land of many curious natural objects, of high plateaux, superb canons, bold buttes and picturesque mesas, dreary plains and stony hills, interspersed with verdant smiling valleys, owing their life to the inevitable irrigation channels. Carved out of the great plateau in the north-east of the State, is the famous Grand Canyon of the Colorado, in which, far below the plain, runs the Colorado River, bordered by the 'Painted Desert,' a giant's natural palette of white, yellow, purple, blue, red, and brown; the colours of the shales and sandstones; and in this strange wilderness arises a petrified forest, trees of Mesozoic time, washed down now to the foot of the mesas in which they were embedded; and blocks and logs of jasper, agate, chalcedony, opal and other silicate deposits, strewn about capriciously in hundreds. This stone forest of a bygone age is now preserved as a national property. On the Gila River is found the curious 'Gila Monster'; and the tarantula, the

scorpion, and other unpleasing creatures of the South-West have there home here, as in the adjoining States and in Mexico. Wild cats and mountain lions and an occasional jaguar are found, and curious birds; in fact, a fauna dwells within the border of Arizona representative of every life-zone except the humid tropics, and from the summit of the mountains down to the Painted Desert we may pass rapidly through all these life-zones. Remarkable, too, is the desert vegetation, the numerous forms of weird cacti, armed with formidable thorns, or yielding luscious fruit. Among these the giant, columnar *Chayas* and the omnipresent *Opuntiac* stand up arrestingly against the forbidding landscape. This giant cactus may reach a height of 40 feet or more, growing in groves, and it has exercised a deep influence on the culture, the faith, the arts and crafts of the Indians, from time immemorial. Valuable mines of gold, copper, and other minerals have enriched the hills; have brought wealth to inhabitant and shareholder.

An active and intelligent people are the folk of Arizona, following many industries, creating wealth and culture out of their varied environment. There is also a curiously mixed strata of folk of Chinese, Japanese-Mexican and Indians, in considerable numbers. Phoenix, the capital, is a popular winter and health resort, with a fine climate; lying on a great plain, surrounded by beautiful cultivated lands, gardens and orchards, irrigated from a great reservoir seventy miles away. Near by the government supports a boarding-school for 700 Indian pupils, sons of the ancient masters of the soil; and the desert laboratory, where desert flora is scientifically studied *in situ*, is another noteworthy institution of Arizona.

We must leave this interesting region, but let us follow the Colorado River through its mighty canyon before we

go, and thence to the sea.

The Colorado River, rising in Wyoming, fed by the snows and rain of the Rocky Mountains, flows through Colorado and Arizona, and a strip of Mexico, for 2,000 miles to its mouth in the Gulf of California. For a thousand miles the river has carved its passage through a sequence of canyons, forming a region of its kind the most wonderful in the world. The Marble Canyon, 66 miles long, reaches a height of 5,000 feet, marvellous enough, but only serving as an entrance to the Grand Canyon, whose walls, in places 6,000 feet high, in successive terraces of splendidly coloured rocks, descend to the gloomy gorge in which the river flows below—"the most sublime of all earthly spectacles," as has long since been said of this terrific gash in the earth's surface, with numerous gorges like those below Niagara and Yosemite. The average depth is 4,000 feet, and the width varies from $4\frac{1}{2}$ to 12 miles from rim to rim, but the bottom channels is but 3,500 feet wide. The succession of rock strata cut through, such as early crystalline rocks, gneiss, slate, granite, quartzite, sandstones, limestones—often of beautiful marble, stained a brilliant red, contrasting with the other brilliant colours, thousands of feet high, pinnacles, towers, turrets, terraces, a facade of seven rock systems—so has the river eaten its way down through the ancient rocks, through deeply buried mountains of bygone geological ages, and we may read the pages of the book of stone here opened as nowhere else on the globe in such stupendous diversity. A playground for superhuman beings might indeed have been the purpose of this tremendous gorge. A mountain 10,000 feet high of homogeneous rock gives little impression of its true height, but the Colorado Canyon, due to its vari-coloured banded structure, furnishes its own comparisons of height. The Canyon has

a literature to itself.

The Colorado River flows onwards past the curious region of the Salton Sea, and it has been termed the Nile of America; its overflow fertilizing the soil, carrying down millions of tons of fertilizing mud. The valley of the Salton Sea, anciently the head of the Gulf, which recedes seaward more than two miles each year, produces wonderful crops and fruits, and upon it have arisen many new villages, some of which are 265 feet below sea-level, for such is the topography of this curious depression. Here, too, the prehistoric folk irrigated their lands and lived their life; and their ruined aqueducts may still be seen.

Crossing the Colorado River to the west, at Yuma, we are in California. Before entering California, however, we must traverse the State of Utah, with its peculiar conditions, and the States to the north.

Probably the most lasting recollection of the traveller in Utah will be one of vast, arid landscapes and barren hills, and if it be summer, great heat reflected from the ground as the train pursues its way, whilst the desert dust, pungent and alkaline, filters in through the windows of the Pullman car, notwithstanding that they are double windows and close shut for the passage of those more particular dusty areas, which extend mainly in the neighbourhood of the Great Salt Lake: and the interior of the vehicle and the clothes of the individual are soon covered with an impalpable white powder. The seasoned traveller over this belt of country dons his long dust cloak or overall, brought for the purpose.

Mountains rise like islands from the sea in this the Great Basin region. Enormous lakes covered the region in glacial times. The principal of these ancient Pleistocene lacustrine beds is known geologically as Lake Bonneville,

whose ancient water-lines, in well-defined wave-cut cliffs and terraces, are to be seen on the surrounding mountains, more than 600 feet above the present level of the water, and geologists point to what must have been curious cycles of ebb and flow in the past. The Great Salt Lake, which occupies the depression, is 75 miles long, and its highly, concentrated briny waters often fluctuate considerably, but there is a deep central trough 30 miles wide and 40 feet deep, which would seem to render the lake secure from permanent drying-up. The waters have no outlet, as it is a closed basin. The margin is of clear sand, and the folk have here a novel and popular bathing resort; novel in that the bather cannot sink or even go beneath the surface fully, on account of the high specific gravity of the salt water—in which it is reminiscent for the Englishman of Droitwich and elsewhere. Salt making is an important industry here.

We cross this singular lake for many miles by the railway, whose embankment cuts across a portion of the waters from Ogden westwards.

But the State of Utah is not composed mainly of briny waters and desert, for man has made beautiful his surroundings by the same methods we have seen in the adjoining States; the art of irrigation and intensive farming. The tree-planted avenues of Salt Lake City, that famous home of the Mormons, and the verdant fields and ranches around, show the fertility of the soil, watered by the mountain streams.

The situation of this important city, which stands at an elevation of over 4,300 feet, is a striking one, with its mountain views and the broad waters of the lake stretching away on either horizon. Brigham Young laid its plans, in great blocks and wide streets—perhaps too wide for convenience, as is the case in many American and

Colonial towns. The great Mormon Temple has granite walls six feet thick, and is 186 feet long, with six spires, one of which rises to the blue Utah sky for 220 feet, crowned with the copper statue of the Angel Moroni. The Tabernacle, elliptical-shaped, with its rounded turtle and shell-shaped roof, without columns, seats 10,000 people. There are other noteworthy buildings, many public institutions, and Roman Catholic, Protestant Episcopal, and Presbyterian cathedrals and churches. The great city and county building, of rough grey Utah sandstone, has a dome crowned by a statue of Columbus, and there are figures of Commerce, Liberty, and Justice at its entrances; whilst its interior is resplendent in Utah onyx. There are many hospitals and charities, a public library, university, and Public School systems, schools of arts and sciences, theatres, Young Men's Christian Association, Masonic Temple, and, in brief, all the institutions of modern and progressive life, with numerous manufactories.

The traveller may perhaps be surprised on entering this fine community to observe the range of activity, as against perhaps very different preconceived notions concerning the Mormon Capital, which, in the popular imagination overseas, figures often as some semi-heathen place. The city lies 710 miles from Denver, and 930 from San Francisco. The population of Salt Lake City is about 70,000. In the year 1900, of about 13,000 foreigners nearly half were English. The early Mormon missionaries who came to Britain were quite successful in their proselytizing, and many leaders of the Mormon Church and other prominent citizens here have been of English birth. In the earlier years of the Church all converts were urged to leave their native countries and make their home in Utah, and glowing accounts were given by the Mormon missionaries of life under the régime. But after 1887

this policy was prohibited by the decrees of the United States Government. In the first decade of this century the total number of the Latter Day Saints—the common name given to this religious sect: the ‘Church of Jesus Christ of Latter Day Saints’—numbered about 350,000, mainly in Utah and the south-western part of the United States. For a frontier community, the moral character of the Mormon appears to have been high, for there was neither gambling nor drunkenness, when these vices were prevalent all around, as matters indeed synonymous with the ‘Wild West.’

We may here cast a glance at the curious doctrines of the Mormons. On an earlier form of the creed a system of polytheism has been implanted, with varying grades of deities in the cosmology; the supreme ruler being the primeval Adam of the Book of Genesis, with Christ, Mahomet, Joseph Smith, and Brigham Young partaking in divinity. To people human bodies begotten on earth with souls, so propagating souls, is the purpose of these ‘deities,’ and polygamy is the method of sexual propagation; the number of the wives and children of the man, the ‘saint’ who dies, being his glory in the next world. Marriage is ‘sealing,’ under the Mormon ceremony, for eternity; a man may be ‘sealed’ to any number of women, but no woman to more than one man. This system of polygamy and salvation presupposes the existence of thousands of spirits awaiting bodies, or incarnation; also, in the ‘celestial’ marriage, women are, thus, only saved through their husbands. There is belief in the Bible as supplemented by the Book of Mormon, and in the gift of prophecy, casting out devils, miracles, and in the inevitable approach of the end of the world, with other matters. Whence came this creed? It is to be recollected that America has always been the home of

curious religious doctrine, a sort of Ultima Thule of fantastic spirits who went there from Europe, and found, and still find, congenial soil among a vast population in the melting-pot of life, where new fermentations are at work, and none to say them nay; and to-day the astonishing vogue of spiritualism, clairvoyance, and so forth, from New York to San Francisco, cannot fail to be remarked by the observant traveller, even if only in the newspaper advertisements devoted thereto.

In 1805, in the State of Vermont, was born one Joseph Smith, of parents and grandparents described as seers of visions and believers in miraculous cures, in heavenly voices and direct revelations. The boy's father was a seeker for hidden treasure and a user of the divining-rod for water-finding, and the son became a crystal-gazer, etc. According to his story there appeared to him, three times on a September night in 1823, the Angel Moroni, telling him that the Bible of the Western Continent, a supplement to the New Testament, was buried in the Hill of Cumorah, and he dug up, he said, a stone box containing a volume made of thin gold plates, 8 inches by 7 inches, covered with writing in characters, said to be the reformed Egyptian tongue. This was the Book of the Mormon, of which, translated, an edition of 5,000 copies was printed. It professes to give the history of America from the time of a 'colony of Jaredites' from the dispersal at the Tower of Babel. The book, however, prohibited polygamy. It was a time peculiarly favourable for a new religious sect, due to religious unrest and the peculiar American receptivity. The subsequent curious history of this creed has a considerable literature of its own. There was a 'Reformation' of the Church in 1856 with certain dreadful tenets—among them an apparent inspiration by the Church of assassination of any suspected of hostility thereto, or of

an intention to escape from Utah and the control of Young—Brigham Young was the second president of the Church: also the doctrine of blood atonement. Later there was suppression, and conflict between the Mormons and the United States troops.

Whatever may be said of the Mormons, there is the fact that they colonized the wilderness, created a remarkable social system, in which every member was provided for, and looked after and educated their women and children, so that none was in want or ignorance; conditions which, unfortunately, cannot be said to obtain in ordinary Christian communities, whether in New York or London, whose 'slums,' with their poverty-stricken folk, are a reproach to modern civilization, and are yet likely to bring some direct consequences or punishment upon communities which permit their continued existence, be it in America or England.

4. SWITZERLAND.

Racially speaking the Swiss do not exist, but there are few people so proud or so conscious of their national unity. German, French, and Italian are welded together in a confederation that is unparalleled in the history of Europe. On the departure of the Roman legionaries the country now known as Switzerland was overrun by the Allemani and the Burgundians, and from these are descended the German and French-speaking Swiss respectively. The pure-blooded Italians of Canton Ticino were formerly a subject race, but these three, together with a sprinkling of Romansch peoples in the Grisons, have combined admirably to form a State as well-knit and cohesive as its former neighbour, Austria-Hungary, was the opposite.

As might be expected of a people with such a history, the Swiss are sturdy and independent, but though they are never obsequious or servile, they have not committed the error of allowing their independence to interfere with their politeness. Sane and logical in their outlook, they see nothing menial in domestic service, and rightly regard an hotel porter or a chambermaid as entitled to the same consideration and courtesy as any other worker. The result of this is that the Swiss hotel servant will not tolerate treatment that his colleague in other countries accepts with a shrug; but in spite of this the Swiss hotels are the best managed in the world, and the servants are invariably civil and obliging.

Owing to the undeveloped state of the factory system, the townsfolk present a far healthier appearance than those of less fortunate countries; and in the rural districts the people are finally built and bronzed by sun and wind. Generally speaking, the German-Swiss are taller and fairer than their compatriots, but improvement of communications and intermarriage are rapidly moderating the difference in type. The amount of hard work done by the peasant women tends to age them prematurely, and even the young girls, though pleasant and cheerful, are rarely of a high level of beauty.

The greater energy and ability of the Teuton have made the German-Swiss indubitably the dominant race. Spreading far over the bounds of their native cantons, they now take the lead in the commercial and civic life of the Confederation. But this permeation is in no sense aggressive or subversive of the rights of the other races, and perfect harmony prevails. Though French and Italian-Swiss still play a great part in the government of the country, there can be little doubt that, when the merging of the races is complete, the German strain will be the most marked, and German alone be the official language of the country.

To understand the spirit of the Swiss people, it is necessary that we should gather some knowledge of the method of government, and though this is a subject on which volumes might be written, I will endeavour to give a brief outline of the system under which the republic is ruled.

The foundation and central idea of the Swiss constitution is the sovereignty of the people. The country is not a simple republic divided into departments as France is, for the Swiss cantons are themselves sovereign states, and the central government has no authority over the purely

domestic affairs of the cantons. Thus they have no equivalent of our Local Government Board. The legislative authority for national matters is vested in the Bundesversammlung, or Federal Assembly, which consists, like our own Parliament, of two chambers. The upper chamber, the Standerath or State Council, has two members for each of the twenty-two cantons of the Confederation, and these members are elected on conditions decided separately by every canton for itself; while the lower house, the Nationalrath or National Assembly, is elected by universal suffrage on a basis of one member to every twenty thousand citizens. In addition to the two chambers there is a cabinet of seven members known as the Bundesrat or Federal Council, the President of which is the President of the Confederation; and this is elected by the two houses of the Bundesversammlung.

All these three bodies are elected for a period of three years, and cannot be dissolved before the expiration of that term; but the President and Vice-President hold office for one year only, and cannot be immediately re-elected. Democratic as this system is, it is not allowed to operate unchecked, the people possessing two rights—that of the Initiative and the Referendum. The Initiative compels any proposal for a revision of the constitution to have the backing of fifty thousand citizens before it can be discussed, and the Referendum enacts that if thirty thousand citizens should so demand, any measure that has passed the Bundesversammlung must be submitted to a vote of the entire electorate before becoming law.

As I have pointed out, the Federal Council legislates only on matters affecting the nation as a whole, the affairs of the cantons being regulated by their own governments. In most cases these governments consist of councils elected by the citizens according to schemes varying in the

different cantons, but in a few of the smaller cantons the legislation is carried out by the whole body of citizens at a given place on a day set apart for the purpose. Such assemblies are called *Landesgemeinden*, and are often accompanied by picturesque ceremonies, to which reference will be made later.

The effect of this system has been to instil into the people a sense of their own dignity, and largely to do away with class distinctions. Of course such distinctions cannot be altogether eradicated, however wise and just may be the system of government, but snobbishness is not a thriving weed in Switzerland. Family influence, whether of wealth or birth, counts for very little. For example, every able-bodied Swiss has to serve in the army; but he cannot enter it as an officer, and no amount of influence will obtain a commission for him unless he really merits it.

Education is another great factor. Switzerland has no schools for the production of gentlemen, since, when every man is his own sovereign, small distinctions fade, but it has many excellent schools for the production of valuable citizens. Rich merchant's son and scavenger's son sit side by side in the free elementary schools, without any sense of incongruity. Children who show sufficient promise are all given the opportunity of going on to the high schools, the technical schools or the universities, the last being infinitely more accessible than in England.

At holiday times there must be few visitors who have not at some time rounded a bend in a mountain path to come face to face with a jolly crowd of children staff in hand and rucksack on back, tramping through the country under the care of teachers every whit as jolly as themselves, singing fit to bring down the very glaciers. Most of them are poorer class children, but there is a sprinkling of those whose parents belong to the professional classes,

but only a clever observer will be able to pick them out.

Meet them by the wayside, these smiling children of the Alps, and if the path be narrow they will step on one side to allow you to pass, greeting you with a pleasant "Grusse," or some other salutation. Though you be dressed in the most English of clothes, which to them are as comical as some of theirs are to you, they will never show the least sign of amusement, however much they may feel it!

Nor is this politeness and simplicity by any means confined to the younger generation. Dour some of the Swiss undoubtedly can be, dour in a manner that the dorest Highlander in Scotland could never dream of, but rude never. Once the ice is broken there are few pleasanter or franker acquaintances; and though in many districts the Swiss do not encourage their neighbours to visit them at their homes, the stranger overtaken by bad weather and seeking shelter will find hospitality readily given. Many times when a torrential downpour has overtaken me on my tramps about the country, I have knocked at some chalet door and found a ready welcome.

If it has been early or late in the season, when the man of the house has been working near at hand, he has come in and we have sat gossiping and smoking, he puffing away at a pipe of English tobacco, and I, for my part, often making a valiant endeavour to smoke his! Also the wayfarer who finds himself hungry when far from an hotel or a restaurant, and who has been unwise enough to omit packing up food to carry with him, will rarely be refused a simple meal at a cottage. In such cases his hostess is unlikely to make a charge, but a present will usually be accepted, except in the more remote districts, where the country people are often like those remote crofters of the Highlands who regard any suggestion of

payment for hospitality as an insult.

In the country, in the town, on the trains or anywhere else the same friendly spirit prevails. Anybody who has a slight knowledge of the language of the district he happens to be in has only himself to blame if he passes through it in silence. But should he enter into conversation with a fellow-traveller, however humble his position may appear, let him treat him as an equal, for the Swiss do not tolerate condescension or patronising airs from any man.

In the towns the garments worn by all classes are, with a few trifling differences of cut, pretty much the same as those worn all over Europe. In the country more obvious differences appear. The men usually wear a short jacket and trousers or breeches of sombre cloth, and a shirt with a wide collar fastened by a knotted cord with tassels; but the collar is frequently worn open and above the coat. Swiss peasants generally have a phenomenal number of shirts owing to the common if peculiar practice of having an immense wash-day about twice a year! A black felt hat is the more usual headgear, of a broad-brimmed type somewhat resembling a *sombrero*; but in the western districts a somewhat full-cut *béret basque* is by no means uncommon. Heavy boots and stockings complete the equipment, and in wet weather an umbrella, for your conservative Switzer despises such new-fangled contrivances as a raincoat.

The women's costume is more difficult to define. The picturesque cantonal costume, with its bright skirt, dark corsage and snow-white bodice, is worn only at feasts and fairs, and can hardly be considered as contemporary. Nowadays comfort and convenience are of more account than elegance, and a cotton blouse and woollen skirt are the general wear. The hat, if worn at all, is too often an

ugly straw erection with a stiff brim, though in Canton Ticino the head is covered by a large black kerchief, worn like a *mantilla*. In the Roman Catholic cantons women who go about bareheaded usually carry a small square of black lace, with which they cover the crown of the head when entering a church. Aprons are of course ubiquitous, and the women often wear heavy boots like the men. For field work many go barefoot, or wear a clumsy wooden sandal attached to the foot by broad leather straps. On Sundays and holidays many women affect a stiff Victorian-looking dress of black silk or cloth, hung about the bosom with as many yards of silver chain, of various patterns and thicknesses, as a woman may comfortably be expected to stagger under!

Home life as we know it in England, where the poorest usually have their own tiny house, is practically non-existent in the larger towns and cities. The great mass of the people live in tenement houses, which in the poorer quarters are huddled together in a narrow compass, intersected by dark alleys that thread these human warrens like grim gorges into which the sun never penetrates. These crowded quarters are to be seen at their most picturesque in Italian Switzerland, where many of the great buildings, like the great "lands" of the Edinburgh Canongate, were once proud palaces. In German Switzerland at least gas masks are quite unnecessary for an exploration of these poorer quarters. The modern expensive tenement buildings are admirable, being fitted with every form of convenience and elegance.

But the real prototype of the Swiss dwelling is, of course, the wooden chalet of the Alps, and these dwellings are perhaps the most picturesque in Europe. Nestling amid the flowery meadows, with the great snow peaks for a background, they look almost as though they had grown

there, instead of having been erected by man. Certainly their presence destroys the beauty of no Alpine scene, and in most cases they indeed add to its beauty, giving just the touch of peaceful homeliness that is required to tone down the savageness and overwhelming splendour of their mountain background.

These houses are usually built of planks of pinewood, on a stone basement about eight to ten feet high. On this is raised the wooden structure, the planks or squared logs being fitted close together, and dovetailed at the corners so that the ends overlap and project. On the level of the first floor is a wooden balcony, connected with the ground by a flight of steps, and the principal entrance of the chalet is on this balcony, which usually serves the combined purpose of entrance hall and drying ground for washing, and in finer weather not infrequently that of dining-room as well. The stone-built ground floor usually serves for storage purposes, the living rooms and bedrooms being in the front portion of the wooden portion, with the kitchen and dairy at the back. Open fireplaces are very rare, the medium employed for heating usually being a huge tiled stove.

Including the ground floor there are few chalets that have not at least three storeys; many have four and even five; and in some of the better built chalets there is an outside balcony to every floor, these balconies being connected by an outside staircase; but though the first-floor balcony not infrequently goes right round the house, it is rarely that the others do so. The windows though numerous are small, the Swiss, in common with many other dwellers in unspoiled atmospheres, being reluctant to admit fresh air to their homes.

The angle of the roof is very wide, and as a general rule in most districts slopes to the sides of the house, and

not to the back and front as is the case in English cottages. The roofs of the older chalets are covered with wooden shingles, sometimes several layers deep and protected against the fury of the winds by logs being laid the whole length of the roof, and great stones being lodged upon them. Of later years, however, some of the newer chalets have been roofed with tiles and even with slates, and it is not impossible that, in days to come, the wooden shingles may be as old-world as thatch has already become in our own country. In the lower valleys I have occasionally seen thatched chalets, but they are very rare.

It is only in Canton Appenzell that one finds the outsides of these wooden houses painted over; in other districts only the window shutters and doors are so treated, usually with green paint, but in Appenzell many of the chalets are covered with a coat of white paint, which, in the writer's opinion, does not improve them. Elsewhere the task of colouring the chalets is left to the sun and the wind. A newly built chalet is more or less the colour of a cigar box, but a few seasons of exposure to the weather soon transforms it to a rich brown shade, which time only serves to deepen and to mellow, until at last a really old chalet, after absorbing the sun of a century or two, takes to itself a deep red-brown hue, that lasts until it falls to pieces. Beautiful as are the rudest of these houses after time has done its work the more elaborate specimens surpass them by far. With every projecting beam quaintly carved, the walls covered with overlapping shingles like the scales of some gigantic fish, and the gables, the eaves of which probably project eight or even ten feet beyond the wall, ornamented by great wooden spandrels to form an elliptical arch, they look like houses from some old fairy tale, fit dwellings for magic dwellers in a magic land.

Compared with these masterpieces of Teutonic peasant art, the villages of some portions of French and Italian Switzerland seem dull and prosaic. Here the houses are of the general type, tall and somewhat grim, with decaying walls of plaster and roofs of mouldering tiles. What picturesqueness there is is usually to be found in some small detail such as a door knocker or a balcony, or in the grouping of the houses on a hill-side or about a church, and few of them placed by themselves present a picture even remotely comparable with the chalet. Nor are they really to be considered as typically Swiss, but rather as foreign houses that have flowed over the frontier! On the borderland the types will be found merging, and such results will be seen as a high French house that might have been transported from Touraine equipped with an arched gable like a chalet.

Whatever their type, there are few that have not one modern improvement rarely found in English villages, namely, electric light. Water power, the "white fuel" of the Swiss, has made this form of illumination far cheaper than in England, and in every valley the cables go striding up hill and down dale, and the remotest villages have a network of overhead wires.

Simple in their habits, the Swiss of these villages rarely eat meat, except in the form of sausage. Milk, cheese, soup and bread form the usual articles of diet; many of the people eating as many as five meals a day. One little foible they have, and it is not confined to Switzerland. In all but the poorest chalets, on the first floor and at the front of the house is their private and peculiar holy of holies. This consists of a room crammed to overflowing with somewhat gaudy and elaborate furniture and the family heirlooms. In Catholic homes there is almost invariably a crucifix in a prominent position. Polished

and cleaned it must be kept always, polished as an agate and clean as a new pin—it is the parlour. But to use it would be sacrilege!

And now I think perhaps we have intruded enough on the homes of this somewhat reserved people. Let us go out through the little garden with its brown palings and its green gate, with its bird boxes hanging in the trees, past the inevitable wood stack under the eaves at the end of the chalet; and, taking care not to fall over the milk pail which as likely as not is leaning against the fence by the gate, let us wander up to the pastures with their chiming cowbells, or down to the towns and villages with their even more continuous church bells, and see this lovable race at their play and at their work.

The little town of Martigny, situated in the great bend of the Rhone Valley, is chiefly remarkable as the best starting point for the most famous of Alpine passes and the loftiest of Alpine peaks. It is divided into the three sections of Martigny-Gare, Martigny-Ville and Martigny-Bourg, and though of Roman foundation shows but little evidence of its long history. The Tour de la Batiaz, an old watch-tower, is believed to be partly Roman, and stands on a rocky mount above the Dranse, which is spanned below the ruin by a covered wooden bridge that is extremely picturesque, and this is by far the most attractive building in Martigny.

Near the Market Place is the Monastery of St. Bernard, the parent house of the famous Hospice on the pass, the fame of which has cast this less interesting abbey into the shade. When we have seen these two buildings, we have exhausted the "lions" of Martigny, which, though a bright and pleasant little town, is rather lacking in interest.

Beyond Martigny-Bourg, the St. Bernard road follows

the picturesque valley of the Dranse, the road to Chamonix over the Col de la Forclaz leading off to the right just outside the town. Now passing through open meadows, now threading a gorge, it crosses and recrosses the stream, climbing steadily all the way, until we reach Sembrancher, at the mouth of the wild Val de Bagnes, in which is the popular resort of Fionnay, at the foot of the Grand Combin.

Passing on, the road ascends the Val d'Entremont to Orsières, where the great snow peaks of the Velan and the Grand Combin come into sight. This is the terminus of the little railway which has hitherto accompanied us from Martigny, and henceforward the road mounts the valley in solitary state. Two roads join ours at Orsières; the one leading up the Val Ferrex and by a mule path over the Col Ferret to Courmayeur, the grandly situated base for expeditions on the Italian face of Mont Blanc; and the other climbing up to Lac Champex, by the side of which is a little resort rapidly gaining popularity among trampers.

Beyond Orsières the valley broadens, and for a time the savageness of the mountains is relieved by smiling pastures, vineyards and cornfields. The road climbs up through the picturesque village of Liddes to Bourg St. Pierre, with a quaint old church, against which is an old Roman milestone marking the 24th Roman mile (a thousand paces, roughly 5,000 feet), from Martigny. Napoleon breakfasted here on his famous crossing of the pass before the Battle of Marengo, and the chair in which he sat is still exhibited at the inn aptly named "The Breakfast of Napoleon."

Leaving Bourg St. Pierre, the road winds up and crosses a gorge into which the torrent that comes down the side valley of Valsorey falls in a great cascade. The ascent steepens and the valley becomes much wilder and

the road passes through a series of wild gorges before reaching the little tavern of the Cantine de Proz. This little inn is in direct communication by telephone with the Hospice at the summit of the pass, and during bad weather the fact that ascending travellers have passed the Cantine is always notified to the monastery, in order that a search party may be sent out if they do not arrive within a reasonable time.

Through scenery of ever increasing wildness and desolation the great high road climbs up and up. At the defile known as the Pas de Marengo, in reference to the great battle which Napoleon fought after his famous crossing, the mountain walls draw very close together, and the road is hemmed in by great cliffs. On emerging from this gloomy canyon, the road crosses the Dranse for the last time, and zig-zags up through a desolate valley to the head of the pass. This valley bears a name of ill omen, the Combe des Morts, or the Corrie of the Dead, owing to the number of travellers who have perished as the result of avalanches along this section of the road. In the upper part of this valley the road passes through a tunnel, and on emerging from this we see the famous Hospice ahead of us. The grey stone buildings look as desolate as the bare slopes of rock and snow by which they are surrounded.

The Great St. Bernard is the oldest of the Alpine passes, having been used since before the dawn of history. By the Roman era it had attained such importance that a temple to Jupiter was erected near the summit, which was named Mons Iovis or the Mount of Jupiter. This name remained in use for centuries, until after the foundation of the present Hospice by Bernard de Menthon, Archdeacon of Aosta, in the latter half of the tenth century. In 1555 the original Hospice was burned down, and the present edifice dates from about that time, though extensive addi-

tions were made in 1898. The Chapel was built in 1686, and for those who are thus privileged, it is a unique experience to hear the solemn voice of the organ pealing out in these wild Alpine wastes.

This was the route used by Napoleon's army on their famous crossing of the Alps in 1800, the march from Martigny to Aosta occupying three days per man, and a week for the entire army. The maintenance of a garrison of forty men at the monastery was a sore tax on the resources of the monks. To-day they dispense free hospitality to the wayfarer, but tourists are expected to leave in the alms-box a sum equal to that which they would pay at an hotel.

The great fame of the monastery of course rests on the rescue work done by the monks and their dogs, who at sunrise and sunset go out to search for travellers lost amid the snow. But the visitor will probably be disappointed by his first sight of these celebrated dogs, for they are not the picturesque shaggy-coated animals of popular imagination. Actually they have short hair and short tempers, and, though admirable in the work for which they are trained, they are not disposed to fraternise with strangers.

Just beyond the Hospice, which stands on the actual summit of the pass, 8,110 feet above sea level, is a little tarn, frozen over nearly all the year round. Beside this a stone pillar marks the Italian frontier, the road leading down to Aosta and the valley of the Po.

The writer has described the course of the St. Bernard road from Martigny, and the pedestrian will still find that place the best from which to explore the pass. The development of the motor coach traffic has however made it now possible to pay a visit from much further afield, and it has become a popular day's excursion from

Montreux and the other resorts of the Lake of Geneva.

The return journey is of course made by the same route as the outward, the configuration of the country proving an insurmountable obstacle to anything in the nature of a circular tour.

Of the roads from Martigny to Chamonix, the one in more general use is that which diverges from the St. Bernard Road at La Croix and crosses the Col de la Forclaz to Trient before joining the route followed by the railway. The other road follows a course similar to that of the railway throughout its length, and is more picturesque than that over the Forclaz. Both these roads may be used by motorists, but there are restrictions imposed by the police, who only permit one-way motor traffic within specified hours, and motorists intending to travel by either of these routes should make enquiries at the police station at Martigny or Chamonix before setting out.

The railway is, in the writer's opinion, one of the most beautiful, if not the most beautiful of the Alpine lines. Starting from the station on the main Simplon Railway, the little train first of all makes its way through the streets of Martigny Ville, and quitting the town, crosses the Dranse by a bridge commanding a splendid view of the Tour de la Batiaz on its rocky eminence, and the quaint old wooden bridge below. Then the line passes through the rich meadows of the Rhone Valley to Vernayaz, where it crosses the Trient at the very mouth of the gloomy gorge which the river has cleft in the mountain wall.

This canyon is extremely narrow, and a wooden gallery has been carried for some distance along the precipitous walls, in order that the tourist may explore its grim recesses. A little beyond Vernayaz, another torrent, the Salanfe, springs from the mouth of another gorge and

plunges 200 feet to the floor of the valley in a magnificent cascade, known as the Pisseyache. This fall is seen to great advantage from the railway, especially after it leaves the village and begins to climb the wall of the valley.

From Vernayaz the train climbs the steep cog and ratchet section that takes it up to Salvan, lying on a green shelf of meadow 1,500 feet above the Rhone Valley. The views on this ascent are superb, but the full glory of the journey is not attained until the steep slopes above the gorge of the Trient are reached. Thenceforward the scenery is spectacular in the extreme. The forested walls of the valley fall almost sheer to the torrent, boiling and racing in its rocky bed thousands of feet below. Over rich meadows and through shady woods, across the face of sheer precipices and along rocky ledges, this fairy railway threads its marvellous track, while across the valley the white expanse of the Glacier de Trient pours down from the northernmost ridge of the Mont Blanc range. Reaching the summit of the line at Finhaut, we descend through Chatelard into the wild valley of Vallorcine, entering France when we cross the Eau Noire, or Black Stream. Changing on to a narrow-gauge branch of the P.L.M. at Vallorcine we plunge under the Col des Montets by a tunnel. . .

Suddenly we emerge into the daylight, and the whole panorama of the Vallée de Chamonix is spread out before us. The floor of the valley is covered with rich green meadows, about which are dotted the brown chalets, and everywhere the grass is spangled with a profusion of wild flowers. Noble buttresses of mountain, clothed in dark pinewoods, rise to the very sky, the stillness of the pines casting a spell of repose over the whole scene. Beautiful as the floor of the valley is, it cannot retain our attention for long; for above it, plainly visible in its entire

length, the range of Mont Blanc rears its domes and pinnacles of ice. Almost immediately above us, the splendid peak of the Aiguille Verte displays its voluptuous folds of crag and glacier, rendered the more imposing by the dark tide of forest that rolls about its base.

Beyond this noble mass the weird and splintered outlines of the Chamonix Aiguilles are silhouetted against the sky in a forest of spires and pinnacles, in magnificent contrast to the pure white dome that soars so superbly in the background. This is Mont Blanc himself, the regal peak that overtops all others in the Alps, and looks every centimetre the Monarch that he is. With his great satellites, the Aiguille and Dome du Gouter, he fills the whole sky with an unbroken expanse of snow that is overwhelming in its magnitude.

Running roughly north and south, the Valley of Chamonix, which is that of the headwaters of the River Arve, is bounded on the east by the great massif of Mont Blanc and on the west by the rugged chain of the Aiguilles Rouges, or Red Needles. The head of the valley is closed by the Col de Balme, which is the watershed between the Arve and the Rhone; and its lower extremity may be considered to be the gorge through which the river flows below Servoz. Within this narrow compass is contained some of the most magnificent scenery in the whole Alpine chain. No less than eight glaciers pour down the slopes of the valley from the ridges of Mont Blanc, and of these five descend so low that their snouts are almost level with the meadows.

The history of this valley can hardly be described as exciting, for it occupied a retired and unimportant place in the world until the dawn of Alpinism brought it into sudden prominence. During the Roman era it was occupied by a Celtic race, and in the writer's opinion this

race has left its mark on the place-names of the valley. In local nomenclature the word "combe" is used to denote a hollow in the mountains such as is called a "cwm" in modern Welsh, and the term "nant," which is used to denote a little glen, is found in Welsh with the same meaning. Other similar comparisons might be drawn, and though the writer cannot quote any evidence in favour of his theory from other sources, the resemblance seems too striking to be mere coincidence.

Although the valley formed part of the great Roman Empire, there is little evidence to prove that the Roman rule was even more than theoretical, though the legions certainly visited the valley at various times. One thing Chamonix certainly does owe to the Romans and that is its name. The meadows being hemmed in on all sides by the great mountain barriers, they called the valley "Campus Munitus," or the fortified meadow, and this gradually became changed and corrupted into the present form of Chamonix; or to give it the full title adopted of late years by a municipality alive to the possibilities of advertisement, Chamonix-Mont-Blanc. The older form of "Chamouni" was in general use until about 1860, and persisted until the closing years of the nineteenth century, but has now quite disappeared.

After being for some years a part of the Kingdom of Sardinia, Chamonix, in common with the rest of Savoy, was restored to France in 1860. Since 1741, when the visit of two Englishmen, Messrs. Wyndham and Pococke, first attracted attention to the charms of the valley, tourist traffic has gradually increased until it has attained the enormous proportions of the present day.

The great attraction at Chamonix is of course Mont Blanc. Were the highest summit of the Alps the mere "monstrum horrendum informe" of Virgil instead of

being one of the most beautiful of mountains, its supremacy in height alone would suffice to attract the tourist. Seen from the outskirts of the little town, with the magnificent outlines of the Aiguille and Dome du Gouter showing clear against the sky to the right of the summit, and the great icefall of Les Bossons climbing up like a silver stair between the pinewoods that mantle the lower slopes, Mont Blanc presents a spectacle that none can behold for the first time without standing spellbound.

If, like the writer, the visitor be privileged to see it for the first time at nightfall, when the valley and the lower slopes are already in dim shadow; when the great white dome alone soars triumphantly into the daylight, and the Glacier des Bossons hangs like Jacob's Ladder between heaven and earth; then will his wonder be increased a thousandfold as he watches the slow fading of the light 'from the upper snows, and the coming of the moonlight to cast a new glamour over the whole scene.'

Mont Blanc, although the highest of all, was one of the first of the Alpine peaks to be conquered. In 1760 the valley was visited by the Genevan savant, Horace Bénédict de Saussure, and he was so impressed by the mountain, that he offered a reward to the first man who should climb it. For twenty-six years this reward was unclaimed, though repeated attempts were made by the men of the valley to gain the summit. In 1786, however, a young man from the village of Les Pélérins, Jacques Balmat by name, explored the upper part of the mountain, and after great privations, involving a night alone on the frozen waste of the Grand Plateau, he discovered a practicable route. Descending to Chamonix, he obtained the company of Michel-Gabriel Paccard, a young doctor, and at 6.23 on the evening of August 8, 1786, they reached the summit. The credit of this ascent is usually

given to Balmat, but there is evidence to show that he was actually employed as a guide by Paccard, who in the ascent itself took a great deal of initiative, and it would appear that the latter is at least entitled to an equal share of the glory.

The Chamonix of to-day is a bright little town, where every description of taste may be suited in the matter of hotels. As a centre for excursions it is unrivalled, the wooded slopes of the valley providing hundreds of walks, and a whole season might very pleasantly be spent in the valley.

The favourite, in this case one might sat the classic, excursion is to the Montenvers. This has been a recognised excursion since the latter half of the eighteenth century, and in bygone days was carried out with the full paraphernalia of guides, ropes and alpenstocks. In 1810 the Empress Josephine made the ascent under the care of no less than sixty-eight guides, a procession that would provoke roars of derision from any modern user of the path, who regards a stout walking stick as a quite sufficient aid to the ascent. Indeed, in these degenerate days there is no need to use the path at all, as a mountain railway runs up from Chamonix, and by this the ascent may be made in about three quarters of an hour.

From the summit of the line there is a wonderful view over the great Mer de Glace, or Sea of Ice, the glacier which fills the immense gorge between the Chamonix Aiguilles and the Aiguille Verte. The scene is one of marvellous beauty. Far below lies the glacier, the surface of which is so crevassed that it has the appearance of frozen waves. This stream of ice comes winding down from the inner recesses of the mountains. Of these recesses we have but a mere glimpse, but in the background, far up the valley, rise the noble ridges of the Grands

Jorasses, on the Italian frontier. Immediately opposite soars a weird obelisk of red rock, many thousands of feet in height, so steep and sharply defined as to look like an immense steeple. This is the Aiguille du Dru, one of the most magnificent rock peaks in the world.

From the Montenvers a pleasant scramble along the slopes will bring one to a point whence it is possible to obtain a view of the glaciers which unite to form this great stream, but the best plan is to cross the glacier, preferably under the care of a guide, and descend to Les Tines by the celebrated Mauvais Pas, literally "bad step," where a narrow path, sufficiently protected, crosses the face of the crags above the glacier.

Another beautiful walk on the slopes of Mont Blanc is to go up through the woods to the Cascade du Dard, a pretty fall on a torrent descending from the Glacier des Pélerins. From this point a beautiful path leads through the woods to a chalet perched on the moraine high above the Glacier des Bossons, of which we have a magnificent view, with the rocks of the Grands Mulets and the summit of Mont Blanc above. There are numerous paths that may be used for the return journey, and the traveller will have the satisfaction of knowing that on his outward journey he has used the path which eventually leads to the summit of the giant himself.

Another pleasant excursion to a glacier is to visit Argentière, near the head of the valley, and to wander across the meadows and over the chaotic terminal moraine to the Glacier d'Argentière. For the lover of wild flowers this excursion is especially to be recommended, for the stretch of rough ground immediately below the glacier is especially fortunate in its flora. Alpenrosen are especially prolific, and low as is the altitude, gentians and soldanellas are to be found amid the flowers more usual at an elevation

of approximately 4,000 feet. The snout of the Argentière Glacier is fringed with lofty ice cliffs, and care should therefore be exercised in approaching it, as not only is there danger of portions of the ice breaking away and falling, but also this particular glacier has a nasty habit of relieving itself of boulders and other débris by shooting them over the cliffs.

To obtain a general view of the Mont Blanc chain, the best course is to ascend the slopes of the Aiguilles Rouges on the opposite side of the valley. There are two viewpoints that are specially notable for their outlook over Mont Blanc. Of these the more famous is the rocky summit of the Brévent, which is a conspicuous feature of the view from the street below the church at Chamonix. This peak is 8,285 feet in height, and although there is a good path, the ascent will be found too fatiguing for all but good walkers. The other is La Flégère, which may be reached from the hamlet of Les Praz d'en Haut by an easy path in a little over two hours. From either of these view-points the whole chain of Mont Blanc is visible in all its majesty, and a visit to Chamonix should include an excursion to at least one of them.

Some miles down the valley, at Servoz, are the magnificent Gorges of the Diosaz, along which a path is carried on wooden galleries. Though not so well-known as some of the Alpine river gorges, and though not so overpowering in their grandeur as those of the Aar or the Trient, these gorges have a beauty of their own that will appeal to many who find the canyons that I have mentioned too gloomy and too awesome. Narrow as the Gorges of the Diosaz are, neither light nor vegetation is excluded, and the river rushes down a series of cascades that is one grand crescendo of beauty. Servoz is also worth visiting for the sake of the view of Mont Blanc which is obtained

from the floor of the valley. This view is entirely different from the well-known silhouette seen from Chamonix, and embraces a number of spurs that are invisible from the better known valley.

5. THE CANADIAN PACIFIC RAILWAY.

AFTER passing through the "Eastern Townships" the railway crosses the St. Lawrence to enter Montreal. You remember that in summer some great liners come right up to Montreal with their first and second-class passengers after leaving the third-class immigrants at Quebec. So now we have met our first line of approach again.

Montreal is a magnificent city with many wide streets, lined by trees; electric tramways hurry past, the shops are filled with the best and latest goods, there are fine public buildings and all the modern improvements. It is a city any country might be proud of, and it is the home of nearly a million people. Walking along its pavements and seeing the fashionably dressed inhabitants, it is difficult to carry one's imagination back to the days of the first white settlers, who, divided by thousands of miles of sea from those who would have protected them, came to plant themselves down among sullen Red Indians who knew nothing of their civilisation or the power of their countrymen.

The name of Jacques Cartier has already been mentioned; he was a Frenchman, the very first white man to penetrate into these regions. In 1535 he came up the St. Lawrence River, fenced in on both sides then by primeval forest. He saw the thin smoke-wreaths curling lazily skyward from the camp fires, and he stared with amazement at the wigwams of the Indians planted on the island at the junction of the St. Lawrence and Ottawa

Rivers. Winter was approaching, though Cartier knew little about the severity of winter in such a country as this. The Indians, who were of the Iroquois tribe, did not kill him as they might easily have done, they fortified their camps with great palisades, because they feared this strange man with a pale skin. So Cartier landed, stayed awhile, and then went away. But the visit had made an indelible impression upon his mind. He was struck with the beauty of the place, and as he was not blind to its business possibilities, he recognised that "Hochelaga," as he called the native village, was an ideal spot for fur-trading operations. The Indians came down the Ottawa River on the one side in their canoes from the unknown wilds to the north which were rich in game, and up the St. Lawrence from the boundless west. The two sets of natives could be met at this point, and their rich loads of furs purchased for those odds and ends made in Europe which appealed so deeply to their childish fancies. Cartier seemed to see here an opening which would quickly make a wealthy man of him. He was additionally impressed with the scheme, because the wide St. Lawrence offered an open water highway between the settlement and the shores of France.

Five years later Cartier returned, and apparently his fur-trading operations met with conspicuous success, for his ships returned to Europe laden to the water's edge with rich and valuable furs of all descriptions. This was the beginning of the great fur-trading industry which has made Canada so famous. Of course the secret could not be kept, and soon there was an expedition of intrepid Englishmen to the shores of Hudson Bay, under the charter granted by King Charles II, authorising the commercial conquest of the great North-West by the small band of so-called Trading Adventurers.

In 1611 that famous Frenchman Samuel de Champlain arrived upon the scene, and like Cartier was impressed by its splendid and charming situation. He established himself upon the island, re-naming the spot Mont Royal, which in the flight of time became condensed and converted into the single word Montreal, and so the great modern city received its name.

The Iroquois Indians did not prove so peaceable and amiable after all. When they found the white men arriving in increasing numbers and settling on the land they regarded as their own, they became fierce and resentful. The inevitable ensued. Peaceful exchange gave way to grim struggles for mastery between the French and Indians. Many were the attacks, and severe were the atrocities committed by both natives and invaders alike. The French settlers happened to be pitted against one of the finest of the Indian races, men who were possessed of splendid physique, strong, lithe of foot, and skilled in the artifices of guerilla warfare. Knowing the wilderness like an open book they found it easy to hang about the settlement, concealed in the shadows of the matted undergrowth, in order to spring unexpectedly on their foes when they were alone or unarmed. Woe betide any Frenchman who ventured from the fort thus, for torture and death were his inevitable lot! The settlers began to look upon the Indians as nothing more than treacherous animals, while the red man considered the white man dangerous, crafty, and covetous. Whenever they had a chance to do so the French ruled the Indians with a rod of iron, determining to break their proud spirits, and the Indians suffered in silence, awaiting the opportunity to wreak a terrible revenge. When at last the Iroquois did attempt to attack the settlement, they were met and held up by a small party of French occupying an outpost up

the river. So stubborn was the spirit of the Frenchmen that, though the Indians surrounded and killed them, they had suffered greatly and gave up their intention of advancing upon the settlement.

This story, however, is merely one of many similar blood-curdling incidents in that thrilling time. The French held their sway by sheer terrorism, and did not trust the Iroquois within the reach of a bullet. The red men, for their part, returned the hatred and mistrust fiercely, and never lost a chance of retaliation.

In 1760 the British entered into possession of the settlement. After the fall of Quebec, French power in Canada had come to an end, although Montreal was the last point they gave up. The official residence of the French governor, the Chateau de Ramezay, is preserved as a museum and has an extremely valuable collection of historical documents, pictures, and curiosities.

Very few traces of the old stirring times remain to-day. The memory of the old Iroquois camp, christened Hochelaga by Cartier, is preserved in the French quarter of the city, and a few historical buildings and crumbling ruins serve to recall the distant past. But that is all.

Montreal has grown with amazing rapidity. Wide streets stretch for miles on either hand, the shore line of the river is dotted with wharves and quays where the commerce of all nations is transacted, palatial buildings devoted to finance, industry, commerce, and the arts and crafts rear their heads above the wealth of trees. In order to gain a vivid impression of the size and importance of the city one must view it from the heights of the public park, Mont Royal, by day, while at night, from the opposite bank of the river, the myriad twinkling lights reflected in the murky waters of the St. Lawrence show many signs of its restless activity.

IN England, if we travel for ten hours, we think that fairly tiring. When we go on into Scotland and spend a night in the train we call that a long journey. Yet the whole length of England and Scotland together could be subtracted from the Canadian Pacific route to Vancouver and still leave 2,000 miles. You can get into the train on the east side of the Continent and remain in the same carriage for four and a half days, going right across to the west. It will be thought that such a journey would be very tedious, but it is not so; the line passes through such varied scenery on its route that there is usually something to divert attention, whether it be the forest, the rolling prairie, the grain-fields, the snow-topped mountains, or the dark canons. Of course, as the distances are so immense the Company has to build its trains very differently from those of a small country like ours, and the coaches are massively made and well hung on springs, so that there may be no vibration and even little oscillation. The coaches are connected by a short passage or gang-way so that one can walk from one end of the train to the other, and thus obtain a little exercise; and there are black servants to answer the bells. Newspaper boys travel on the trains and walk through them selling their wares, and best of all, there is at the end of the train an observation-car, where passengers can sit in comfort and see the scenery. The sides are filled in by large plate-glass windows through which everything can be seen, and outside there is a platform roofed in, but open all round so that splendidly wide panoramas can be taken in. As this is at the back of the train, it is sheltered while the engine is running, and many people spend most of their time here, while only the most blasé don't at least take the trouble to come when the line is threading its way through the great ramparts of the Rockies and Selkirks in the

west. But we are a long way from that yet, and have much to see in the meantime.

The train is very comfortably fitted up, the restaurant or dining-car is well decorated like the dining-room of a big hotel, and the food is wonderfully good, especially considering the necessary limitations. The train is steam-heated and electrically lighted. On the finest trains there is a drawing-room with arm-chairs, and indeed living on board is more like being in an hotel than a train. When night comes the seats of the compartments are made up into berths something like those on board ship by the negro attendants; each is provided with clean linen and a heavy curtain to let down—a very necessary precaution, because there are no special compartments for men and ladies, but every one just takes the next number that turns up in booking his ticket.

Have you ever seen an American locomotive? We have got into the way of calling them engines over here, but the old word locomotive is really much more correct, for an engine may be anything that drives machinery, and there are many stationary engines. The American locomotives are much larger than our engines, and look larger still because there are often no raised platforms to the stations. They have a great ungainly cow-catcher in front and a huge boiler above, while the driver and fireman seem perched up ridiculously high in their cab. In their black garb the locomotives certainly appear ugly in comparison with the smartness of bright green, brown, or blue of the British engines, but the sombre massive outlines convey the impression of immense strength, which is supported by the deep guttural "pough-pough" as they grunt and grumble along the road of steel.

Anyway, we can imagine we are off in one of these luxuriously fitted trains drawn by a huge engine, and we

have left Montreal behind. The usual way is to go right ahead by the main line to Ottawa, but there is another route often preferred by people who are not in a hurry.

Every one knows the five enormous lakes lying between Canada and the States, near the east side; they are Lakes Ontario, Erie, Michigan, Huron, and Superior, and the line gives a chance of a "Lake route" as well as the other. By this we should join the main line again at Fort William at the head of Lake Superior, having passed by steamer all along Lake Huron from Port McNicoll to get there. We can go another way too; by keeping on as far as Sudbury on the main line, we can then branch off to a place called Sault Sainte Marie, pronounced "Soo-see-ma-ree"—which no one could guess by looking at it. The "Lake Route" can only be taken in summer, but then it is well worth trying, for these great inland seas are studded with islands and the scenery is often beautiful.

By the main line we soon reach Ottawa, which is the seat of the Canadian Government.

It appears rather strange that neither Montreal nor Toronto should have been selected for this honour. But this is because when the project of a capital was discussed these two cities contended so bitterly for the honour of being chosen, that the Government, in order to give neither any cause for dissatisfaction, decided to ignore the claims of both, and to create a new capital city at By on the Ottawa River. This place had received its odd name because in 1823 a Colonel By was sent by the British Government to survey the Rideau Canal, and a small community of workmen lived at this point in their shacks, as it was a convenient centre for the works. So the settlement was called after their chief, but in 1854 the name was changed to Ottawa.

Both Montreal and Toronto were of course very jealous that a new capital should have been created instead of the honour having been bestowed on them, and even to-day one often hears the residents of these two cities refer disparagingly to the capital city as "By-town," to convey the impression that it is really nowhere; only "near by" either Montreal or Toronto, according to the citizenship of the speaker!

The ground on which the city now stands was taken by a man named Sparks in settlement of a debt, or rather as payment for labour. He did not think much of his bargain at that time, as the land was covered with dense forest and was apparently worthless. He candidly confessed that he thought he had got the worst of the deal, but later on he found he had no cause for complaint.

In striking contrast to the quiet, yet dignified charm of Ottawa, is the town of Hull on the opposite bank of the river. This is the great centre of the eastern Canadian lumber industry, and the river bank is in consequence piled with unsightly stacks of timber for miles, while the waterway is obstructed by huge booms of logs which have been floated down to the mills from the forests far away. As the train sweeps across the broad blue waterway, a splendid view of the Chaudière Falls, 600 feet in width by 40 feet in height, is gained. Below the railway bridge are the Rideau Falls. Both these falls of water have been pressed into service to supply electricity for a hundred and one purposes in the city of Ottawa and its suburbs.

By the time the slender spires of the Parliament Buildings have slipped from sight the railway has entered the valley of the Ottawa River, which was followed because it offered the best and easiest path for the band of steel. The scenery changes constantly, but most of it is forest, with glimpses of saw-mills here and there.

Falls of water occur at frequent intervals, and around each a small colony has sprung up, because here they are not allowed to waste themselves as mere sights, but one and all are used to generate electric current. The country becomes wilder and wilder as the Temiskaming country is gained. Memories of the early pioneering and fur-trading days are recalled by the Hudson Bay Trading post at Mattawa, which to-day is a busy lumber town.

This is the land of the Indian, rich in legends, and the scene of many blood-curdling encounters between rival races, especially those of the Iroquois and the Hurons. Alas! but few traces of the Indian now remain. The only tribe inhabiting this wild country is one called the Algonquin, but his characteristics have deteriorated, his calling has gone, the days of trapping have vanished, and he depends for existence mainly in guiding the hunter or explorer, for he is clever with the paddle, and knows the district as far north as James's Bay by heart.

Much of this country is unknown to this day. The forests are trackless except for the trails trodden by the Indians here and there, and scarcely a sound of human activity disturbs the silence of Nature. So the train runs on steadily until we get to the country of Lake Nipissing. This is counted quite a small lake here, being only 90 miles in length by 20 miles in width; but what should we think of it in Britain, where our longest—Loch Awe—is only 30 miles long! Near this the dense veil of woodland is torn aside to reveal small open tracts of land where farming is being industriously carried on. If we are lucky we might even catch a glimpse of a bear enjoying a feast of ripe berries, or a moose drinking, or a deer staring in wonder at the roaring train, for the country is overrun with game, and is beloved by the sportsman.

The silence of the forest is broken by the whir and

bustle of industry as we run into Sudbury, a growing town in the heart of the wilderness. Sudbury is world-famous because it is in the centre of the greatest known deposits of the two metals, nickel and copper. A space of rolling land, not so large as that covered by the city of London, is estimated to contain 500,000,000 tons of these metals. The smoke from the smelters outside the town may be seen from the train. The product, a mixture of copper and nickel known as "matte," is sent to various places, even to South Wales, to be refined. Sudbury is an important junction, and if we want to go to the town with the wonderful name, we must branch off here by a line known as the "Soo" for short. The main line pushes directly ahead, and in a short time bursts through wild hills to pick up the shore line of Lake Superior. The bleak sombre cliffs drop sheer into the water, many of the towering precipices being so formidable that the engineers cut the path for the railway through their bases, only a few feet above the water.

This is the most sterile corner of Canada. The country is too rough and barren for agriculture, while the climate in winter is almost arctic in its severity. Here and there the desolation is relieved by small mining camps where the hardened miners are toiling like Trojans to win gold, zinc, and other metals from the dense rock.

It is, however, a glorious chance for the artist. The blunt, precipitous, barren cliffs seem to change in colour every moment as the light plays on them, and they are very grand. Two favourite haunts are Black Bay and Thunder Cape, the nose of the latter thrusting itself blackly against the sky. Often its gaunt outline is only faintly discernible through the mists rising from the lake. Nestling in the shadow of the towering cape are the twin towns of Port Arthur and Fort William, where the passengers who

have come by the "Lake Route" join us again.

We must now go back for a moment and imagine we chose the "Lake Route," which is open in the summer, and see what Canada can show us that way.

By this route we go to Toronto, the second largest city in the Dominion, and the seat of the government of its own province, Ontario. Toronto is an imposing city. Lofty sky-scrappers or many-storeyed buildings rise sheer up into the sky from the heart of the city, and the suburbs are crowded with factories—a busy, prosperous and humming hive. If Ottawa is the government city, there is no doubt Toronto is the business one. The city stands right on Lake Ontario and has a large shipping trade. You would think you were at some great seaport to see the vessels of all sizes and sorts passing in and out or awaiting cargo and passengers. They can pass up this lake, down the St. Lawrence, which flows from it, and so to the open sea.

If we should change our mind at the last minute we could make our way to the Great West by another route over this amazing railway system. A line runs direct to the Border City of Windsor on the bank of the Detroit River which connects Lake St. Clair and Erie. The railway now dips to pass under the waterway through huge steel tunnels, like the London tubes, to re-emerge in the United States at Detroit, and then continues to Chicago. From the American city the "Soo" line swings north-westwards to pass through St. Paul and Minneapolis, crosses the frontier at Emerson, and continues to Winnipeg. This detour of 1433 miles is very useful for business men, but we have decided to take the All-Canadian route from Toronto.

The Canadian Pacific shares its station at Toronto with the Grand Trunk Railway, and from this point runs

northward for 122 miles to Port McNicoll, its port on Lake Huron, whence the steamer is taken for a fresh-water ocean voyage of 555 miles to Fort William.

It is difficult to grasp from mere description the immense size of these lakes, which are linked together by narrow straits. They are in very truth huge inland seas, subject to all the moods of anger and calm associated with the salt-water oceans. Pride of place must be granted to Lake Superior, which is the largest expanse of fresh water in the world. From end to end it measures 412 miles, while it is 167 miles in width at its broadest part, and covers an area of 31,200 square miles. In fact, it is so large that Ireland might almost be dropped into it!

It is not surprising that advantage has always been taken of these enormous sheets of water in the interests of commerce. Indeed, there are very few seas, either fresh or salt, which support such a huge volume of traffic. Iron ore and grain are shipped by millions of tons every year over this great inland water route. The number of vessels engaged in this trade alone is so large that they pass up and down barely half a mile apart, both day and night, in two continuous streams, those southward bound carrying ore or grain, while the craft proceeding northwards for the most part are empty.

The ships engaged in this traffic are rather curious in appearance. They recall the barges, so familiar upon British rivers, only they are of immense length, with the captain's bridge in the bow and the engines and funnel at the extreme stern. The whole of the deck is clear, and is covered with large hatches to hasten and ease the task of loading and unloading, for of course the reason for the ship's being is the carrying trade. Some of these ships are able to carry as many as 8000 tons of ore.

The passenger vessels are equally striking. They

have been called "Lake liners," and really it is a very good description. They are immense craft, fitted up in the most luxurious manner, and quite like the liners one sees departing from the ports in Britain to distant parts of the world. They go at high speed, for the journey across Lake Superior occupies only about twenty-two hours; from Port McNicoll to Fort William takes about forty hours.

Port McNicoll has developed into a thriving ship-building centre. The growing maritime traffic of the lakes has demanded shipyards on its shores for building and repairing purposes. When we emerge from Georgian Bay, the steamer heads directly towards the entrance to the St. Mary River, which connects Lakes Huron and Superior.

One of the most curious things about these huge sheets of water is that they are joined to each other by narrow straits which allow steamers to pass from one to the other. Lakes Superior, Huron, and Michigan grow out like the separate pieces of a horse-chestnut leaf joined just at the base of the stalk.

At the point where the waters of Lake Superior find their outlet to form the St. Mary River there is a steep descent, because Lake Superior lies about 30 feet above Lake Huron, and accordingly the waters rush and tumble down the bank at the mouth of the upper lake with fearful velocity, forming the St. Mary's or "Soo" Rapids. When the Indians roved these inland seas they ran their canoes through these treacherous waters, deftly steering by the rocks and other dangers which lurked just below the white curling ruffs of foam. But when the white man came with the locomotive and steamship the canoe disappeared; it was useless to commerce. In order that the large vessels might pass from one lake to the other,

enormous locks have been built on either side of the rapids, fitted with powerful machinery, whereby two or three vessels at a time are lifted or lowered from one level to the other. These locks have become internationalised—that is to say, that though one side of the rapids belongs to the United States and the other is the property of the Canadian Government, an arrangement has been made whereby the locks are free to the commerce of all nations, and vessels pay no tolls for passing through. The expenses of operation and maintenance are borne entirely by the two neighbouring nations.

Owing to the heavy traffic on the lakes these locks have to be kept working night and day, and so exacting is the demand that a chain of ships is always waiting at both ends to be lifted or lowered as desired. About thirty minutes are required to pass through the locks, the vessels being handled in order, without favour. To watch a vessel coming up is a fascinating sight. When it enters the lock, any one standing on the canal wall can look down upon the deck of the ship. Speedily it rises up and a few seconds later, when the task is completed, the water, which is within a few inches of the crest of the wall, has lifted the vessel so high that it towers above one like a huge building, especially if the craft has no cargo, as then it stands high out of the water. The machinery for moving the ponderous gates and the massive pumps for admitting and discharging the water are driven by electricity, obtained by harnessing the rapids between the two lakes.

Although the steamships have driven the Indian canoe into oblivion, yet there still remains one Huron brave who cannot forget the times and means of travel in his boyhood days. He has not lost his prowess with the paddle and dug-out. Once a year he brings out his

primitive craft, and seating himself therein, runs the scurrying "Soo" Rapids. Occasionally he will be accompanied by a white man seeking thrilling excitement. The latter certainly has his wish gratified, for the frail craft shoots through the race with terrific velocity, the Indian paddling for all he is worth so as to keep steerage way on his canoe, and at last he is shot out on to the bosom of the quieter river beneath like an arrow from a bow.

Travelling across these inland seas for the first time is a curious experience. It is difficult to realise that a lake can be so large that one is out of sight of land for a whole day. The water is singularly pure and transparent. At night the spectacle is even more unusual. The mast-head lights of the processions of freight boats on either side, travelling in well-defined lines, give one the idea that one is passing along a street of water lighted by powerful electric lamps!

In the summer when nature is in a good mood, the trip is ideal, although the sudden changes of climate are rather upsetting. I have been on the lake in midsummer, when the noonday sun registered about 100 degrees in the shade, and there was not a breath of air to bring relief. Yet six hours later the vessel was enveloped in a thick white fog hanging like a blanket upon the water, and the cold was so intense that heavy overcoats had to be put on, and the steam heating turned on in the saloons.

Then the storms which spring up suddenly are exceedingly violent; the vessel rolls and pitches among waves which rise to 15 or 18 feet. Wrecks among the boats carrying heavy ore, especially during the equinox, are sometimes numerous, because the coasts are dangerous. There is a curious belief that Lake Superior never gives up its dead.

In the northern journey the end of the fresh-water

passage is announced by sighting the grim outline of Thunder Cape, and it is not long before the ship is made fast beside the quay at Fort William, where the train is waiting to carry passengers on to the Pacific coast. In fact, we have once more reached the main line.

At the head of Lake Superior are the two ports already mentioned, Fort William and Port Arthur, the only two Canadian shipping centres on the lake. Separated only by 4 miles, there is a keen though friendly rivalry between the two towns for supremacy. Yet they are quite unlike each other. Port Arthur is essentially a manufacturing and industrial centre, with its factories and blast furnaces, from which dense black smoke pours throughout the livelong day. The water-side is choked with booms of logs waiting to be sawn into lumber. Fort William, on the other hand, is much pleasanter to any one not there for business only. Its situation is charming and its history is interesting.

The advance of civilisation has swept away nearly every trace of the old stirring times. The post has gone; the wooden house in which the furs used to be stored now contains an engine for driving machinery. Fort William has its own harbour.

It appears strange at first sight that there should be two such excellent ports within 4 miles of one another. Nevertheless, to visit first one and then the other gives one a fine idea of the commerce of the country. Shops, factories, and private residences are overshadowed by tall, gaunt, and ugly buildings, where the grain is stored to await the call of ships from all parts of the world. Long writhing trains of big box-cars, with their sides bulging outwards under the pressure of the grain within, are drawn into the gloomy depths of the buildings. Huge shovels empty the wagons of their contents into capacious

boxes, or hoppers, to be weighed. Then the grain is hoisted to the top of the building by means of what is called a conveyor. This is an endless pair of chains to which narrow, trough-like receptacles are attached at intervals rather like the scoops of a dredger. As they round the bottom corner of the ladder they scoop up the wheat, carry it to the top, to empty it out as they round the upper point, into another conveyor, which carries it away at that height. So the endless chains turn, and the troughs scoop up the wheat, rise to the top, tip it out and go down again, each in turn. If we are lucky enough to be allowed to go to the top of the building and enter the storehouse, we shall see something very interesting.

To see the wheat drawn up in shovelfuls by the troughs is nothing like so fascinating as to see it all fall down again in a great waterfall of grain, or, as we should say, a grain-fall.

The wheat is being raised to be put into great receptacles like deep wells, so deep indeed that when we stand at the top and peer into them we cannot see the bottom. Up here when the machinery is set in motion an endless belt bearing a great ridge of grain on it moves along. This is the grain which is being continually brought up and emptied out by the troughs. The endless band piled with grain comes along and lets the load fall down into the wells; we can hear it go in a rattling cascade. When the sun shines through the roof, it lights up the piles of grain and makes them glitter like heaps of golden beads. Sometimes several wells are being filled at the same time by as many moving wheat-laden bands, and then the noise is deafening, just like a waterfall, while the dust rises up like spray.

Now come down on to the next floor to see what happens to the wheat. Here there are further huge boxes

as big as a room, not square right down to the bottom, but running into points like tops. These are called hoppers, and are filled with the grain. A ship outside down below is waiting to be loaded with grain. The man in charge on this floor weighs the grain, for the whole of this enormous top or "hopper" is swung upon a balance; when it dips, a bell rings to show the weight has been taken, then the stopper at the point of the top is withdrawn and with a loud roar the grain flies out in a spout into the hold of the ship which is open directly below. So the work goes on gaily, and the wheat marches upstairs, is stored and weighed, and let loose automatically and continuously, and ever the streams of golden grain pour forth to feed the waiting people.

At Fort William watches must be altered one hour, for here we are passing into the "Central" time zone. Here also one notices that all the clocks are made with figures 1 to 24, for it is considered easier to reckon time right round once, rather than as we do twice over from 1 to 12, for the day and the night, distinguishing them by the letters a.m.—ante-meridian—before midday, or p.m.—post-meridian—after midday.

After Fort William the line leaves the shores of Lake Superior and plunges once more into the wild, broken country. This is Ontario, and the signs of civilisation are lumber-camps and the sawmills. Small farms may be seen now and again, where daring settlers have penetrated the heart of this wild region to find valuable markets for their produce in the mining and lumber towns. On some of the lakes, skirted by the railway, steamers may be seen, for though these lakes seem simply nothing after the five gigantic ones, they are really quite large, and the steamers carry passengers across and up and down them during the summer, but in the winter the

people use sleighs, for the water is held in the grip of the frost.

The most famous sight on this long journey of 419 miles is the Kakabeka waterfalls, about 16 miles from Fort William, where the Kaministikwia River pours over a ledge in a tremendous volume. It is a sight of wondrous beauty, as the height of the fall even exceeds the far-famed Niagara cataract.

As the train travels farther and farther westwards the woodland country flattens out, the timber becomes thinner and thinner, while the patches of open country grow larger and larger in area until finally the trees disappear. The eastern edge of the prairie, which rolls away almost uninterruptedly to the foothills of the Rocky Mountains nearly a thousand miles away, is entered. As the train hurries on, a thin dark cloud hovers above the horizon. It increases in size and intensity until along its lower edge may be described the unbroken line of tall chimneys and lofty buildings. This is the city of Winnipeg, the Metropolis of the Middle West.

6. SOUTH.

At daylight on April 7th the long-desired peak of Clarence Island came into view, but not until Worsley, Wild and Hurley had unanimously confirmed my observation was I satisfied that I was really looking at land. The island was still more than sixty miles away, but to our eyes it had something of the appearance of home. The longing to feel solid earth under our feet filled our hearts.

I wrote on this day: "The swell is more marked to-day, and I feel sure we are at the verge of the floe-ice. One strong gale followed by a calm would scatter the pack, I think, and then we could push through. I have been thinking much of our prospects. . . . The island is the last outpost of the south and our final chance of a landing-place. Beyond it lies the broad Atlantic. Our little boats may be compelled any day now to sail unsheltered over the open sea, with a thousand leagues of ocean separating them from the land to the north and east. It seems vital that we should land on Clarence Island or its neighbour, Elephant Island."

A little later, after reviewing the whole situation in the light of our circumstances, I made up my mind that we should try to reach Deception Island. Clarence Island and Elephant Island lay comparatively near to us and were separated by some eighty miles of water from Prince George Island, which was about 150 miles away from our camp on the berg. From this island a chain of similar islands extends westward, terminating in Deception Island.

We knew from the Admiralty sailing directions that

for quick action, but our case would have been desperate if the ice had broken into small pieces not large enough to support our party, and not loose enough to permit us the use of the boats.

The following day was Sunday, but it was no day of rest for us. In fact it saw both our forced departure from the floe on which we had lived for nearly six months and also the start of our journeyings in the boats.

"This," I wrote, "has been an eventful day for us. At 7 a.m. the long swell from the north-west was coming in more freely than on the previous day and was driving the floes together in the utmost confusion. . . . Our own floe was suffering in the general disturbance, and after breakfast I ordered the tents to be struck and everything prepared for an immediate start when the boats could be launched."

I had decided to take the *James Caird* myself, with Wild and eleven men. This was the largest of our boats, and she carried the major portion of our stores. Worsley had charge of the *Dudley Docker* with nine men, and Hudson and Crean were the senior men in the *Stancomb Wills*.

Soon after breakfast the ice closed again, and we were standing by, with our preparations as complete as we could make them, when at 11 a.m. our floe suddenly split right across under the boats. We rushed our gear on to the larger of the two pieces, and watched anxiously for the next development. The crack had cut right through the site of my tent. Our home was being shattered under our feet, and we had a sense of loss and incompleteness hard to describe, for during all those months on the floe we had almost ceased to realise that it was but a sheet of ice floating on unfathomed seas.

The call to action came at 1 p.m., after we had all

eaten a good meal of seal meat. We could not take all our meat with us, so we regarded each pound eaten as a pound saved! The *Dudley Docker* and the *Stancomb Wills* were quickly launched. Stores were thrown in, and the two boats were pulled clear of the immediate floes towards a pool of open water three miles broad, in which floated a lone and mighty berg.

The *James Caird* was the last boat to leave, heavily loaded with stores and odds and ends of camp equipment. Many things regarded by us as essentials at that time were to be discarded later on. Man can sustain life with very scanty means, and the trappings of civilisation are soon cast aside in the face of stern realities.

The three boats were a mile away from our floe home at 2 p.m., and then we had a narrow escape from a rush of foam-clad water and tossing ice that approached us, like the tidal bore of a river. It was an unusual and startling experience; the effect of tidal action on ice is not often as marked as it was on that day, and if we had failed to pull clear of the advancing ice, accompanied as it was by a large wave, we should certainly have been swamped.

For an hour we pulled hard to windward of the berg which lay in the open water. The swell was crashing on its perpendicular sides and throwing spray to a height of 60 feet. Under other conditions we might have paused to have admired the spectacle: but night was coming on fast, and we needed a camping-place. So we hastened forward in the twilight in search of a flat, old floe, and presently found a fairly large piece rocking in the swell. It was not by any means an ideal camping-place, but darkness had overtaken us. We hauled the boats up, and by 8 p.m. the tents were pitched and the blubber-stove was burning cheerily. Soon all hands were well fed and happy.

in their tents, and snatches of song came to me as I wrote up my log.

An intangible feeling of uneasiness made me leave my tent about 11 p.m. to glance round the quiet camp, and I had started to walk across the floe to warn the watchman to look carefully for cracks when the floe lifted on the crest of a swell and cracked under my feet as I was passing the men's tent.

The men were in one of the dome-shaped tents, and it began to stretch apart as the ice opened. A muffled sound, suggestive of suffocation, came from the stretching tent. I rushed forward, helped some men to come out from under the canvas, and called out, "Are you all right?" "There are two in the water," someone answered.

The crack had widened to about 4 feet, and as I threw myself down at the edge I saw a whitish object floating in the water. It was a sleeping-bag with a man inside. I was able to grasp it, and, with a heave, lifted man and bag on to the floe. A few seconds later the ice-edges came together again with tremendous force. Fortunately, there had been but one man in the water, the rescued bag containing Holness, who was wet but otherwise unscathed.

Almost immediately the crack began again to open. The *James Caird* and my tent were on one side of the opening and the remaining two boats and the rest of the camp were on the other side. With help I struck my tent, and then all hands manned the painter and rushed the *James Caird* across the opening crack. We held on to the rope while, one by one, the men left on our side jumped the channel or scrambled over by means of the boat.

Finally I was left alone. The night had swallowed all the others, and the rapid movement of the ice forced

me to let go the painter. For a moment I felt that my piece of rocking floe was the loneliest place in the world. But Wild's quick brain had immediately grasped the situation, and the boat was already being manned and hauled to the ice-edge. Two or three minutes later she reached me, and I was ferried across to the camp.

We were now on a piece of flat ice about 200 feet long and 100 feet wide. There was no more sleep for any of us during that night, but, although our position was almost as critical as possible, we were cheered by the fact that we were on the move at last, and no longer drifting helplessly at the mercy of wind and current.

The first glimmerings of dawn came at 6 a.m., and two hours later the pack opened and we launched our boats. The *James Caird* was in the lead, with the *Stancomb Wills* next and the *Dudley Docker* in the rear. Our way was across the open sea, and soon after noon we swung round the north end of the pack and laid a course to the westward. Immediately our boats began to make heavy weather. They shipped sprays which froze as they fell and covered men and gear with ice.

It was soon clear that we could not proceed safely, so I put the *James Caird* round and ran for the shelter of the pack again, the other boats following. By 3 p.m. we were back inside the outer line of ice where the sea was not breaking, but all hands were cold and tired. A big floeberg resting peacefully caught my eye, and half an hour later we had hauled up the boats and pitched camp for the night. Every one of us needed rest after the troubles of the previous night and the unaccustomed strain of the last thirty-six hours at the oars.

Our berg appeared well able to withstand the battering of the sea, and looked too deep and massive to be seriously affected by the swell: but it was not as safe as it looked,

and when daylight came we saw that the pack had closed round it, and that in the heavy swell we could not possibly launch our boats.

The highest point of the berg was about 15 feet above sea-level, and during the day Worsley, Wild and I were continually climbing to this point and staring out to the horizon in search of a break in the pack. After long hours had dragged past, far away on the lift of the swell, a dark break in the tossing field of ice appeared. I do not think I had ever quite so keenly felt the anxiety which belongs to leadership.

When I looked down at the camp I could see that my companions were waiting with more than ordinary interest to learn what I thought about it all. After one particularly heavy collision somebody shouted sharply, "She has cracked in the middle." This turned out to be a mere surface-break in the snow, but the carpenter mentioned calmly that earlier in the day he had actually gone adrift on a fragment of ice. He had been standing near the edge of our camping-ground when the ice under his feet parted from the parent mass, but a quick jump over the widening gap saved him.

The hours dragged on. One of the anxieties in my mind was the chance that the current would drive us through the eighty-mile gap between Clarence Island and Prince George Island into the open Atlantic; but slowly the open water came nearer, and at noon it had almost reached us. A long lane, narrow but navigable, stretched out to the south-west horizon.

Our chance came a little later, and we rushed our boats over the edge of the reeling berg and swung them clear of the ice-foot as it rose beneath them. We flung stores and gear aboard and within a few minutes were away. With the rolling ice on either side of us the three

boats made progress down the lane, and presently we saw a wider stretch of water to the west which seemed to offer us release from the grip of the pack. At the head of an ice-tongue, which nearly closed the gap leading to this wider stretch, was a wave-worn berg shaped like some curious antediluvian monster, an icy Cerberus guarding the way.

At dusk we made fast to a heavy floe, but our hopes of a quiet night were quickly shattered, for we were soon compeiled to cast off because pieces of loose ice began to work round the floe. Constant rain and snow squalls blotted out the stars and soaked us through, and at times it was only by shouting to each other that we could keep the boats together. Nobody, owing to the severe cold, had any sleep, and since we could only see a few yards ahead we did not dare to pull fast enough to keep ourselves warm.

All around us we could hear the killer-whales blowing, their short, sharp hisses sounding like sudden escapes of steam. They were a source of great anxiety, for a boat could easily have been capsized by one of them coming up to blow; and we had an uneasy feeling that the white bottoms of the boats would look like ice from below.

Early on the morning of April 12th the weather improved and the wind dropped. At dawn I looked around at the faces of my companions in the *James Caird* and saw pinched and drawn features. Wild sat at the rudder with the same calm, confident expression which he would have worn under happier conditions. But all the men, though evidently suffering, were doing their best to be cheerful, and the prospect of a hot breakfast was inspiring.

I told all the boats that directly we could find a

suitable floe the cooker would be started and that hot milk and Bovril would soon make us all feel better. Away we rowed to the westward through the open pack, and the hunger of the men could be gauged by the floes they considered suitable for our camping-place. At eight o'clock a respectable floe appeared ahead and we pulled up to it. The galley was landed, and presently the welcome steam rose from the cooking food, as the blubber-stove flared and smoked. Never did a cook work under more anxious scrutiny.

Worsley, Crean and I sayed in our respective boats to keep them steady and prevent collisions with the floe, but the other men were able to stretch their limbs and run to and fro in the "kitchen," as somebody called it.

The sun was now rising gloriously, our Burberry suits were drying and the ice was melting off our beards, and the steaming food had given us new vigour. Within an hour we were off again to the west with all sails set. We had been making westward with oars and sails since April 9th and fair easterly winds had prevailed. Hopes ran high as to the noon observation for position. Optimists thought that we had gained sixty miles towards our goal, and the most cautious gave us at least thirty miles. As noon approached I saw Worsley ready to take his observation, and after he had got it we waited eagerly for him to work out the sight. The result was a grievous disappointment. Instead of making a good run to the westward we had made a big drift to the south-east. After a whispered consultation with Worsley and Wild I announced that we had not made as much progress as we had hoped for, but I did not think it wise to inform the hands that we were actually thirty miles to the east of the position which we had occupied when leaving the floe on the 9th.

The question of our course now demanded further

consideration. Deception Island seemed to be beyond our reach. The wind was foul for Elephant Island, and, as the sea was clear to the south-west, I discussed with Worsley and Wild the advisability of proceeding to Hope Bay on the mainland of the Antarctic Continent, now only eighty miles distant. Elephant Island was the nearest land, but it lay outside the main body of pack, and even if the wind had been fair we should have hesitated at that time to face the high sea which was running in the open.

We laid a course roughly for Hope Bay, and again the boats moved on. I gave Worsley a line for a berg ahead and told him, if possible, to make fast before darkness set in. This was about 3 p.m., and towards dusk the *Dudley Docker* came beating down towards us, and Worsley reported that he had been close to the berg and had found it unapproachable.

The news was bad, but two miles away we could see a large piece of ice, and to it we managed, after some trouble, to secure the boats. I brought my boat bow on to the floe, while Howe, with the painter in his hand, stood ready to jump. He just managed to get a footing on the edge of the floe and make the painter fast to a hummock, but there was no possibility of getting the galley ashore, so we started the Primus lamps.

The other two boats were fastened alongside the *James Caird*, but in the rough, choppy sea they began to bump so heavily that I had to slack away the painter of the *Stancomb Wills* and put her astern. Much ice was coming round the floe and had to be poled off. Then the *Dudley Docker*, being the heavier boat, began to damage the *James Caird*, and I slacked the *Dudley Docker* away. The *James Caird* remained moored to the ice, with the other two boats in line behind her. The darkness had become complete, and we strained our eyes to see the fragments

of ice which threatened us.

As the light improved the wind shifted to the south-east, and drove the boats broadside on towards the jagged floe of ice. There was no time to cast off, so we had to cut the painter of the *James Caird* and pole her off, thus losing much valuable rope.

Then we pushed away from the floe and all night long lay in the open, freezing sea. The boats were attached to one another by their painters, and most of the time the *Dudley Docker* kept the other boats up to the swell, the men who were rowing being in better case than those of us who were inactive.

The temperature was down to 4° below zero, and a film of ice formed on the surface of the sea. When we were not on watch we lay in each other's arms for warmth. Our frozen suits thawed where our bodies met, and, as the slightest movement exposed these comparatively warm spots to the biting air, we clung motionless. Occasionally, from an almost clear sky, snow showers fell silently on the sea, and lay a thin shroud of white over our bodies and our boats.

The dawn of April 13th came clear and bright, but most of the men were now looking seriously worn and strained. Their lips were cracked, and the beards of even the younger men might have been those of patriarchs, for the frost and salt spray had made them white. Obviously it was imperative for us to land quickly, and I decided to run for Elephant Island. The wind had shifted fair for that rocky isle, then about 100 miles away, and the pack which separated us from Hope Bay had closed up during the night.

At 6 a.m. we made a distribution of stores among the three boats, in view of the possibility that they might be separated. Hot breakfast was out of the question, but I

gave orders that all hands might eat as much as they pleased, this concession being partly due to the fact that we should have to jettison some of our stores when we reached the open sea, and partly to the hope that a liberal meal would compensate to some extent for the lack of warm food and shelter. Unfortunately some of the men could not take advantage of the extra food owing to sea sickness, and it was hard indeed that this devastating sickness should have been added to the sufferings which they already had to bear.

We ran before the wind through the loose pack, a man in the bow of each boat trying to pole off with a broken oar the lumps of ice which could not be avoided. I regarded speed as essential. The *James Caird* was in the lead and bore the brunt of the encounters with the lurking fragments, then came the *Dudley Docker*, and the *Stancomb Wills* followed. I gave orders that the boats should keep thirty to forty yards apart, so that the danger of a collision, if one boat was checked by the ice, should be reduced.

We made our way through the lanes until at noon we suddenly shot out of the pack into the open ocean. Sails were soon up, and, with the sun shining brightly, we enjoyed for a few hours a sense of the freedom and magic of the sea. At last we were free from the ice, in water which our ships could navigate; thoughts of home came to birth once more, and the difficulties ahead of us dwindled in fancy almost to nothing.

During the afternoon the wind freshened and the deeply-laden boats shipped much water, and steered badly in the rising sea. I had laid the course for Elephant Island, and we made such good progress that, had not the danger of the boats being separated been too great, I should have been tempted to carry on through the night.

But it was imperative that the party should be kept together, and also I thought it possible that we might overrun our goal in the darkness and be unable to return.

So we made a sea-anchor of oars and hove to, and though we did what we could to make things comfortable during the hours of darkness there was really little that could be done. A terrible night followed, and I doubted if all of the men would survive it. The temperature was below zero and the wind penetrated our clothes and chilled us almost unbearably.

One of our troubles was lack of water, for we had emerged so suddenly from the pack into the open sea that we had not had time to take aboard ice for melting in the cookers, and without ice we could not have hot food. The condition of most of the men was pitiable. All of us had swollen mouths and could hardly touch the food. I longed intensely for the dawn, and at last daylight came; and a magnificent sunrise heralded in what we hoped would be our last day in the boats.

By this time we were all dreadfully thirsty, and although we could get momentary relief by chewing pieces of raw seal meat and swallowing the blood, our thirst was soon redoubled owing to the saltiness of the flesh. I gave orders, therefore, that meat should only be served out at stated times during the day, or when thirst seemed to threaten the reason of any particular individual.

In the full daylight Elephant Island showed cold and severe. The island was on the bearings Worsley had laid down, and I congratulated him on the accuracy of his navigation under most difficult circumstances. The *Stancomb Wills* came up and McIlroy reported that Blackborrow's feet were severely frostbitten, but, unfortunate as this was, nothing could be done. Most of the men were frostbitten to some extent, and it was interesting to

notice that the "old-timers," Wild, Crean, Hurley and I, were all right. Apparently we were acclimatised to ordinary Antarctic temperature, though we discovered later that we were not immune.

Progress was slow during the day, but gradually Elephant Island came nearer. We would have given all the tea in China for a lump of ice to melt into water, but no ice was within our reach. Always, while I attended to the other boats, signalling and ordering, Wild sat at the tiller of the *James Caird*. He seemed unmoved by fatigue and unshaken by privation.

About 4 p.m. a stiff breeze came up ahead and impeded our progress. When darkness set in our goal was still some miles away. A heavy sea was running, and we soon lost sight of the *Stancomb Wills*, astern of the *James Caird* at the length of the painter (the *James Caird* having taken her permanently in tow), but occasionally the white gleam of broken water revealed her presence. When the darkness was complete I sat in the stern with my hand on the painter so that I might know if the other boat broke away, and I kept that position during the night.

It was a stern night. Harder and harder blew the wind, and fiercer and fiercer grew the sea. The temperature had fallen very low, and it seemed that the general discomfort of our situation could scarcely have been increased. But the land looming ahead was a beacon of safety, and I think that, in spite of our pitiable sufferings, we were all buoyed up by the hope that the coming day would see the end of our immediate troubles.

Towards midnight the wind shifted, and this change enabled us to bear up closer to the island. A little later the *Dudley Docker* ran down to the *James Caird*, and Worsley shouted a suggestion that he should go ahead and search for a landing-place. I told him he could try,

but that he must not lose sight of the *James Caird*. Just as he left a heavy snow-squall came down, and in the darkness the boats parted.

This separation made me anxious during the remaining hours of the night, for I could not be sure that all was well with the missing boat; but my anxiety was, as a matter of fact, groundless. I will quote extracts of Worsley's own account of what happened to the *Dudley Docker*.

"About midnight we lost sight of the *James Caird* with the *Stancomb Wills* in tow, but not long after saw the light of the *James Caird's* compass-lamp, which Sir Ernest was flashing on their sail to guide us. We answered by lighting our candle under the tent and letting the light shine through. With this candle our poor fellows lit their pipes, their only solace, as our raging thirst prevented us from eating anything. By this time we had got into a bad tide-rip, which, combined with the heavy, lumpy sea, made it almost impossible to keep the *Dudley Docker* from swamping. As it was we shipped several bad seas over the stern as well as abeam and over the bows.

"Lees, who owned himself to be a rotten oarsman, made good here by strenuous bailing, in which he was well seconded by Cheetham. Greenstreet, a splendid fellow, relieved me at the tiller and helped generally. He and Macklin were my chief supports as stroke-oars throughout. McLeod and Cheetham were two good sailors and oars. We had now had 108 hours of toil, tumbling, freezing and soaking, with little or no sleep. I think Sir Ernest, Wild, Greenstreet and I could say that we had no sleep at all.

"The temperature was 20° below freezing-point. Greenstreet's right foot got badly frost-bitten, but Lees restored it by holding it in his sweater against his stomach.

We were close to the land as the morning approached, but could see nothing of it through the snow and spindrift. My eyes began to fail me. I could not see or judge distance properly, and found myself falling asleep momentarily at the tiller. At 3 a.m. Greenstreet relieved me there. I was so cramped from long hours in the constrained position I was forced to assume at the tiller that the other men had to pull me amidships and straighten me out like a jack-knife, first rubbing my thighs, groin and stomach.

"At daylight we found ourselves close alongside the land, but the weather was so thick we could not see where to make for a landing. I had again taken the tiller after an hour's rest and I ran the *Dudley Docker* off before the gale, following the coast around to the north. At first this course was fairly risky, but by 8 a.m. we had obtained a slight lee from the land. Then I was able to keep her very close in, along a glacier front, with the object of picking up lumps of fresh-water ice as we sailed through them. Our thirst was intense. We soon had some ice aboard, and for the next hour and a half we sucked and chewed fragments with greedy relish.

"All this time we had seen no possible landing-place, but at 9-30 a.m. we spied a narrow, rocky beach at the base of some very high crags and cliffs, and made for it. To our joy we sighted the *James Caird* and the *Stancomb Wills* sailing into the same haven just ahead of us. So delighted were we that we gave three cheers."

Our experiences on the *James Caird* had been similar although we had been unable to keep up to windward as well as the *Dudley Docker* had done. The weather was very thick in the morning, indeed at 7 a.m. we were right under the cliffs before we saw them. We also picked up pieces of ice and sucked them eagerly. At 9 a.m. at the

northwest end of the island we saw a narrow beach at the foot of the cliffs; outside lay a fringe of rocks heavily beaten by the surf, but with a narrow channel showing as a break in the foaming water. Unattractive as the spot was for a landing-place I decided that we must risk it. Two days and nights without drink or hot food had played havoc with most of the men, and we could not assume that any safer haven was within reach.

The *Stancomb Wills* was the lighter and handier boat, and I called her alongside with the intention of taking her through the gap first to ascertain the possibilities of a landing. Just as I was climbing into the *Stancomb Wills* I saw the *Dudley Docker*, and the sight took a great load off my mind.

Rowing carefully we brought the *Stancomb Wills* towards the opening in the reef, then, with a few strong strokes, we shot through on the top of a swell and ran the boat on to a stony beach. The next swell lifted her a little farther. It was the first landing ever made on Elephant Island, and I thought the honour should belong to Blackborrow, the youngest member of the Expedition, but I had forgotten that his frost-bitten feet would prevent him from appreciating the honour thrust upon him.

We landed the cook with his blubber-stove, a supply of fuel, and some packets of dried milk, and also several of the men. Then the rest of us pulled out again to pilot the other boats through the channel, and within a few minutes the three boats were aground.

When I landed for the second time a curious spectacle met my eyes. Some of the men were reeling about the beach as if they were intoxicated. They were laughing uproariously, picking up stones and letting handfuls of pebbles trickle between their fingers, like misers gloating over hoarded gold. I remember that Wild came ashore

as I was looking at the men, and stood beside me as easy and unconcerned as if he had stepped out of his car for a stroll in the Park.

The stores were soon ashore, but our strength was nearly exhausted, and it was heavy work carrying our goods over the rough pebbles and rocks to the foot of the cliff. We did not, however, dare to leave anything within reach of the tide. There was no rest for the cook during that day. The blubber-stove flared and spluttered fiercely as he cooked meal after meal. We drank water and ate seal meat until every man had reached his limit.

The tents were pitched with oars for supports, and by 3 p.m. our camp was in order, and most of the men turned in early for a safe and glorious sleep.

Before getting into the tents, Wild, Worsley and Hurley accompanied me on an inspection of our beach, and we found the outlook to be anything but cheering. Obvious signs showed that at spring tides our little beach would be covered by the water right up to the foot of the cliffs. Clearly we should have to find some better resting-place, but I decided not to share this unwelcome news with the men until they had enjoyed the full sweetness of comparatively untroubled rest.

The accompanying plan will show our exact position more clearly than I can describe it. The cliffs at the back of the beach were inaccessible except at two points where there were steep snow-slopes.

We were not worried about food, for, apart from our rations, there were seals on the beach, and there was also a ringed penguin rookery within reach.

These attractions, however, were overridden by the fact that the beach was open to the attack of wind and sea from the north-east and east. Before turning in that night I studied the whole position most carefully, and

came to the reluctant conclusion that we must move on.

Early next morning all hands were astir. The sun shone brightly and we spread out our wet gear to dry and made the beach look like a particularly disreputable gipsy camp. I had decided to send Wild along the coast in the *Stancomb Wills* to look for a new camping-ground, on which I hoped the party would be able to live for weeks or even months in safety.

Wild, accompanied by Marston, Crean, Vincent and McCarthy, pushed off in the *Stancomb Wills* at 11 a.m. and proceeded westward along the coast. Then Hurley and I walked along the beach towards the west, searching for a place where we could get the boats ashore and make a permanent camp in the event of Wild's search proving fruitless. But after three hours' vain toil we had to turn back.

The *Stancomb Wills* had not returned by nightfall, but at 8 p.m. we heard a hail in the distance and soon, like a pale ghost out of the darkness, the boat appeared. I was awaiting Wild's report most anxiously, and was greatly relieved when he told me that he had discovered a sandy spot, seven miles to the west, about 200 yards long, running out at right angles to the coast and terminating at the seaward end in a mass of rock.

Wild said that this place was the only possible camping-ground he had seen, and that, although in very heavy gales it might be spray-blown, he did not think that the seas would actually break over it. The boats could be run on a shelving beach, and, in any case, it would be a great improvement on our very narrow beach.

After hearing this good news I was eager to get away before the weather, which had been fine for two days, changed, and I told all hands that we should make an early start on the following morning.

The morning of April 17th came fine and clear; the

sea was smooth, but in the offing we could see a line of pack which seemed to be approaching. The appearance of ice emphasised the importance of getting away promptly, for it would have been a serious matter had we been imprisoned on the beach by the pack. The preparations for leaving the beach took longer than I had expected, and, indeed, some of the men were reluctant to leave the barren safety of the beach and to venture once more on the ocean. A mishap befell us when we were launching the boats, for we were using oars as rollers, and three of these were broken, leaving us short for the journey which had still to be undertaken.

But the move was absolutely necessary, and by 11 a.m. we were away, the *James Caird* leading. Almost immediately a southerly gale sprang up, and we were straining at the oars with the gale on our bows. Never had we found a severer task. The wind shifted from south to south-west, and the shortage of oars became a serious matter. After two hours of strenuous labour we were almost exhausted, but then we were fortunate enough to find some shelter behind a point of rock; and there we rested while we ate our cold ration.

After half an hour's pause I gave the order to start again. The *Dudley Docker* was pulling with three oars, and she fell away to leeward in a particularly heavy squall. I anxiously watched her battling up against wind and sea, but could do nothing to help her, as the *James Caird*, being the heavier boat, was hard pressed to make any progress. The only thing to do was to go ahead and hope for the best. All hands were wet to the skin and many of them were feeling the cold severely.

We forged on slowly, and passed inside a great pillar of rock standing out to sea and towering to a height of about 2,400 feet. A line of reef stretched between the

shore and this pillar, and at first I thought that we should have to face the raging sea outside, but a break in the white surf revealed a gap in the reef and we laboured through. The *Stancomb Wills* followed safely, but I had lost sight of the *Dudley Docker*, and as she had been making so much lee-way it was obvious she would have to go outside the pillar. It was a bad time, but I dared not pause to see what had happened to her. At last, about 5 p.m., the *James Caird* and the *Stancomb Wills* reached calmer water, and we saw Wild's beach just ahead of us. I looked back for the *Dudley Docker*, but looked in vain.

Rocks studded the shallow water round the spit, and the sea surged amongst them. I ordered the *Stancomb Wills* to run on to the beach at the place which looked smoothest, and in a few moments the boat was ashore the men jumping out and holding her amongst the receding wave. When I saw that she was safe I ran the *James Caird* in. We slipped the painter round a rock, and then began to get out the stores and gear, working like men possessed, for the boats could not be pulled up until they had been emptied.

We were still labouring at the boats when I saw Rickenson turn white and stagger in the surf. His heart had been temporarily unequal to the strain placed upon it, and he needed prompt medical attention. He was one of those eager souls who do more than their share of work, and who will try to do more than they are physically capable of doing. Like many of the members of the Expedition he was suffering from bad salt-water boils.

I was very anxious about the *Dudley Docker*, but within half an hour the missing boat appeared and presently reached the smoother water of the bay. We watched her coming in with that sense of relief which the mariner feels when he crosses the harbour bar.

The tide was going out rapidly, and Worsley lightened the *Dudley Docker* by placing some cases on an outer rock, from which they were afterwards retrieved. Then he beached his boat, and with many hands at work we soon had our three craft above high-water mark.

The spit was by no means an ideal camping-ground; it was rough, bleak, and inhospitable, but some of the larger rocks sheltered us a little from the wind, and, as we clustered round the blubber-stove, we were quite a cheerful company. After all, another stage of the homeward journey was finished, and for an hour we could afford to forget the problems of the future.

The snow had made it impossible for us to find the tide-line, and we were uncertain how far the sea would encroach upon our beach. I pitched my tent on the seaward side of the camp so that I might have early warning of danger, and, sure enough, about 2 a.m. a little wave forced its way under the tent-cloth. After this practical demonstration that we had not gone far enough away from the sea, we took down our tents and re-pitched them close against the high rocks at the seaward end of the spit, where large boulders made an uncomfortable resting-place. Snow was falling heavily, and it was difficult to see where we could find safety. Then all hands helped to pull the boats farther up the beach, and at this task we suffered a serious misfortune.

Two of our bags of clothing had been placed under the bilge of the *James Caird*, and, before we realised the danger, a wave had lifted the boat and carried the two bags into the surf. We had no chance to recover them. But this was not our only misfortune, for in the early morning our big eight-man tent was blown to pieces.

A southerly gale was blowing on the morning of April 18th, and drifting snow covered everything. The outlook

indeed was cheerless, but much work had got to be done. Some sea-elephants were lying about the beach, and we killed several of the younger ones for their meat and blubber. The big tent could not be replaced, and in order to provide shelter for the men we turned the *Dudley Docker* upside down and wedged up the weather side with boulders. We also lashed the painter and stern rope round the heaviest rocks which we could find, so as to guard against the danger of the boat being moved by the wind.

The gale continued all day, while I made a careful examination of the spit to ascertain its possibilities as a camping-ground. Apparently some of the beach lay above high-water mark, and the rocks which stood above the shingle gave a measure of shelter. At the seaward end of the spit were the high rocks which I have mentioned, and there—we had noted with satisfaction on landing—were a few thousand ringed penguins and some gentoos.

But at 8 a.m. on this morning I noticed the ringed penguins mustering in orderly fashion close to the water edge. At first I thought that they were preparing for the daily fishing excursion, but presently realised that they were on the point of migrating. Hurriedly I organised a raid upon them, but we were too late; only a few of the weaker ones fell victims to our needs, the main army took to the sea and we saw them no more.

The gentoo penguins, however, remained with us, and, although they were few in numbers, the weight of their legs and breast is greater than that of the adelie, a point that particularly appealed to us.

The deserted rookery was sure at all times to be above high-water mark, and we mounted the rocky ledge to search for a place on which to pitch our tents. The disadvantages of a camp on the rookery were obvious—the

smell, to put it mildly, was strong; but our choice of sites was small, and during that afternoon we dug out a site for two tents in the débris of the rookery and levelled it off with snow and rocks.

My tent, No. 1, was pitched close under the cliff, and there I lived during my stay on Elephant Island. Crean's tent was close by, and the other three tents, which had fairly clean snow under them, were some yards away. The fifth tent was a ramshackle affair. The material of the torn eight-man tent had been drawn over a rough framework of oars, and thus shelter of a kind was provided for the men who occupied it.

On April 18th we took to our sleeping-bags early, but my companions and I in No. 1 tent were not destined to spend a pleasant night. The heat of our bodies soon melted the snow and refuse beneath us, and the floor of the tent became an evil-smelling yellow mud. Additionally, the snow drifting from the cliff above us weighted the sides of the tent, and during the night a particularly stormy gust brought our little home down on top of us. There, however, we stayed until the morning, for it was hopeless to set about re-pitching the tent amid a raging storm and in the darkness of the night.

On the morning of April 19th the weather was still bad, and some of the men were showing signs of demoralisation and were disinclined to leave their tents when the hour came for turning out. It was apparent that they were thinking more of the discomforts of the moment than of the good fortune which had brought us to sound ground and comparative safety; and only by rather drastic methods were they induced to turn to.

The southerly gale was still so severe that I was blown down as I went along the beach to kill a seal. The cooking pots from No. 2 tent at the same moment took a flying

run into the sea, but as nearly all our cooking was done over the blubber-stove these pots were fortunately not essential. The galley was set up by the rocks close to my tent, in a hole we had dug through the débris of the penguin rookery. Cases of stores gave some shelter from the wind, and a spread sail kept some of the snow off the cook while he was working. He had not much idle time; the amount of seal and sea-elephant steak and blubber consumed by our hungry party was almost incredible, and he earned everybody's gratitude by his unflagging energy in preparing meals which, to us at least, were savoury and satisfying.

Frankly, we needed all the comfort which hot food could give us. The icy fingers of the gale pushed relentlessly through our own garments and tattered tents. The snow swathed us and our gear, and set traps for our stumbling feet. The rising sea beat against the rocks and shingle, and tossed fragments of floe-ice within a few feet of our boats. The consoling feature of the situation was that our camp was safe. We could endure the discomforts, and I felt that all of us would be benefited by this opportunity to rest and recuperate.

The increasing sea made it necessary for us to drag our boats farther up the beach, and when this was done I discussed with Wild and Worsley the chances of reaching South Georgia before the winter locked the sea against us. For every conceivable reason some effort to secure relief had got to be made. The health and mental condition of several men were causing me serious anxiety, and the food supply was also a vital consideration. I did not dare confidently to count upon supplies of meat and blubber, for animals seemed to have deserted the beach, and the winter was near.

The conclusion was forced upon me that a boat

failure, to make the best of his way to Deception Island in the spring. I determined to take Worsley with me as I had a very high opinion of his accuracy and quickness as a navigator—an opinion that was only enhanced during our journey.

Four other men were required, and, although I thought of leaving Crean as a right-hand man for Wild, he begged so hard to come that, after consulting Wild, I promised to take him. Then I called the men together, explained my plan, and asked for volunteers. Many came forward at once, and I finally selected McNeish, McCarthy and Vincent, in addition to Worsley and Crean. McIlroy and Macklin were both anxious to go but realised that their duty lay on the island with the sick men. The crew seemed a strong one, and as I looked at the men I felt confidence increasing.

After the decision was made, I walked through the blizzard with Worsley and Wild to examine the *James Caird*. The 20-foot boat had never looked big, but when I viewed her in the light of our new undertaking she seemed in some mysterious way to have shrunk. She was an ordinary ship's whaler, fairly strong, but showing signs of the strain she had endured. Standing beside her, and looking at the fringe of the tumultuous sea, there was no doubt that our voyage would be a big adventure.

I called McCarthy, the carpenter, and asked him if he could do anything to make the ship more seaworthy. He asked at once if he was to go with me, and seemed quite pleased when I answered "Yes." He was over fifty years of age and not altogether fit, but he was very quick and had a good knowledge of sailing-boats. He told me that he could contrive some sort of covering for the *James Caird* if he was allowed to use the lids of the cases and the four sledge-runners, which we had lashed inside the

boat for use in the event of a landing on Graham Land at Wilhelmina Bay. He proposed to complete the covering with some of our canvas, and immediately began to make his plans.

Noon had passed, the gale was more severe than ever, and the tents were being so buffeted and battered by the wind that it did not appear possible for them to hold out for many more days. So we made our way to the snow-slope at the shoreward end of the spit, with the intention of digging a hole in the snow large enough to shelter the whole party. But after examining the spot we saw that any hole which we could dig would in all probability be quickly filled by the drift.

On the following morning (April 20th) the gale was stronger than ever and no work could be done. A seal came up on the beach during that day, and so urgent was our need of food and blubber that I called all hands, and organised a line of beaters instead of simply walking up to the seal and hitting it on the nose. We were prepared to fall *en masse* upon this seal if it tried to escape. The kill was made with a pick-handle, and in a few minutes we had five days' food and six days' fuel stowed away in a place of safety above high-water mark.

7. MY FLIGHT TO THE CAPE.

A journey from London through Egypt and the heart of Africa to Cape Town has for centuries appealed to the world as a great adventure. And so a few years ago, when I contemplated this trip with an aeroplane as my means of transport, everyone looked upon the journey as a somewhat hazardous undertaking.

For ages we have heard of "darkest Africa." Little seemed to be known of the geography of this part of the world by the general public, and so possibly it was quite natural that my scheme should be regarded as somewhat impracticable, although Sir Pierrre Van Ryneveld and Sir Quinton Brand managed to fly to the Cape with great difficulty six years ago.

For over four years I had been contemplating the London-Cape Town flight, and had many times gone into the details of organisation and considered the type of aircraft best suited for the job. My progress was always checked when it came to the question of finance, for it was so difficult to find a really sound reason with which to persuade any company or individual to finance such a scheme, apart from the fact that it was good long-sighted policy and sound propaganda for British aviation.

However, last year I induced twenty-one different companies directly or indirectly connected with aviation to support a flight of survey from London to Cape Town and back. On my struggles in the summer of 1925 in grappling with the difficulties, not only of getting finance, but of putting down supplies through regions of uncharted

territory, organising the preparation of old and disused landing grounds, communicating with hosts of officials and various forwarding agencies, I will not dwell, except to say that in a somewhat impaired condition of health, owing to the terrific worry and work of this organisation, by November 15th I found myself ready to start.

In the light of my experiences on a recent previous flight from London to Rangoon and back, when I took Air Vice-Marshal Sir Sefton Brancker on a flight of survey, I came to the conclusion that I could select no better craft for this occasion than that which I used on the Rangoon expedition, namely a De Havilland type 50, and we took the identical machine. It was necessary, however, to make an alteration in the power plant. In view of the fact that I should have to take off from high-altitude landing grounds in Central and South Africa where the density of the atmosphere is so rarefied that in the heat of the day it is equivalent to that at a height of 10,000 feet at home; it was obvious that I should need extra power to get off.

On the Rangoon flight most of the landing grounds, especially those in the hot countries, were in heavy air at sea level the entire way, and we used a 230-H.P. Siddeley Puma engine which did its work very well. But for the Cape flight I decided to have installed a 385-H.P. Siddeley Jaguar, which is an air cooled engine, with the result that my De Havilland would have approximately another 160-H.P. for exactly the same over-all weight.

Before telling the tale of our adventures I must introduce the other two members of the expedition; Mr. A. B. Elliott, who was the engineer on the Rangoon flight, and who had been with me on many other occasions, was the engineer on this trip also. It had been decided that a cinematograph film should be made of the whole

venture so that the British public might share in a minor degree all our experiences. Thus it came about that the Gaumont Company selected Mr. B. W. G. Emmott from their staff to come with us to make the picture.

For those who have never seen the De Havilland type 50, let me give a brief outline of the machine. It is a biplane—that is, it has four wings and a body—and the passenger cabin is immediately behind the engine, and between the upper and lower planes. The pilot's cockpit is separate and right behind the cabin, but there is a little communicating window inside the cockpit to the rear of the cabin, so that it was possible for me to converse with my crew during flight. The pilot's seat is high up, so that when the machine was in flight I had an uninterrupted view ahead, over the top of the cabin in front of me.

Our departure from Stag Lane Aerodrome was of great interest and no little amusement to those who saw us off. Stowing the spares, luggage and equipment on board seemed to be the chief business of the day. Firstly we carried underneath the cabin a spare propeller, which had been carefully covered in canvas and screened off. Then there was a certain number of small spare parts that might be required for the machine and engine. Emmott seemed to have a terrific amount of camera gear to pack away, for, apart from the cinematograph camera, there were many thousands of feet of film to be carried and a hefty ungainly tripod. Then there was my own little ciné camera and still camera, Emmott's press camera, and I believe Elliott had one also. Then again we had guns to go on board, because I came to the conclusion that, should we by any misfortune have to land in some uninhabited country or tractless jungle, the guns would not only be a protection but might be our only means of getting food after we had exhausted our few days' emer-

passing the Customs and other little formalities, we were all ready for the start; in fact I was getting somewhat impatient to get away, for I am never very keen on the "official good-bye" business. Perhaps my impatience accounted for the fact that I opened my engine a little too quickly as I was taking off on that very cold morning, and consequently momentarily choked her, so that I had to shut off and open out again more slowly. With our reserve of power, however, we were in the air like a rocket and heading for Lympne, only too thankful to be away at last.

On the first day we only reached Paris, and refrained from carrying on to Lyons, because I felt that we were all so tired after the final rush of getting away—though there were others who said we could not resist the temptation of a night in Paris!

On the following day we flew on to Lyons in indifferent weather, and as the hour was too late for us to make Pisa, our intended next stop, we pushed on to Marseilles instead and there spent the night. Bad weather welcomed us next morning, but after it had cleared a little we flew on again for Pisa.

This flight gave me an opportunity to prove what I have said so many times, that the worst bumps in the air are not experienced necessarily in the heat of the tropics, or from hot or cold air rising, but through up and down currents caused by gales dashing over mountains. As a rule the Riviera coastline is one of the great fine weather spots of the world, and the view from an aeroplane flying at a few thousand feet, two or three miles out to sea, is a sight that will never be forgotten by anyone who is fortunate enough to witness it.

As one looks northwards towards the land, there is a deep blue sea in the foreground below such as is not

known round the British Isles, and its silver crested breakers dash in a mass of white foam on a rocky shore. From an altitude of 3,000 or 4,000 feet Monte Carlo looks like a collection of fairy palaces clustered on the cliff side, with a little model harbour where perhaps one or two trim steam yachts lie at anchor, and beyond the breakwater, contrasting so vividly with the blue ocean, the snow-white sails of various skiffs.

As one's eye travels beyond the town, there appears a view of massive precipitous cliffs, cut with mountain roadways that are really fine engineering feats. High up on these mountain slopes can be seen ancient little villages, very often built on pinnacles, belonging to a bygone age when the native of this coastline had to take refuge in his own small stronghold from the barbarian who might invade him from Northern Europe, or from the pirate and adventurer of the sea. Higher still are fresh mountain ranges with deep valleys, and beyond are the snow-capped Alps whose vividness is intensified by the brilliant sunshine, so that the cloudless blue sky against which these peaks are silhouetted seems to merge into a turquoise hue on the horizon.

When we flew along this coastline one day last November, a vastly different spectacle was to be seen. The sky was overcast and grey, while the Alps were buried in low cloud and mist; but the weather condition which caused us real trouble was the violent, strong north-east wind which for hundreds of miles was dashing over these ice-clad peaks. The result was that by the time the gale had reached the Mediterranean the whole atmosphere seemed to be carried in one mighty chopped-up downrush to the sea.

The further we proceeded along the coastline the more violent became the atmosphere, and so I thought

that by flying low under the cliff we might possibly avoid the main disturbance; but here the down current was so violent that it was difficult to keep the machine on an even keel. I then decided to climb to a high altitude in search of a calmer zone so, opening out the engine and pulling back the control lever, we very quickly shot up to 6,000 feet. But the higher we went the worse became the bumps, and the machine at times seemed to be almost uncontrollable.

Emmott and Elliott in the cabin were having a very rough time, for it was with great difficulty that they could keep in their seats. While Elliott strove to keep the baggage in position, Emmott was struggling with his beloved camera which I thought might be broken at any moment, as very often baggage and passengers' heads touched the roof of the cabin as the machine was caught in some violent down current.

All this took place in a very short space of time, and we quickly decided that the only course of action was to get away from the trouble, the mountains; and so we headed for the open sea. This was not sufficient to get rid of all the bumps, and I resorted to an old plan that I had practised so often before; we flew right out to sea, away from the shore and very low over the water which evidently acts as a cushion for the down currents of the wind, and gives a more or less steady, even atmosphere. In this way we continued across the bay before Genoa, skimming over the sea within twenty feet of the water, in fact so low down were we flying that when we encountered a fleet of fishing smacks it was necessary to climb a little to clear their masts. It was here we had the little thrill of flashing by these boats as they were tossed in the rough sea, much to the excitement of the fishermen who waved vigorously to us as we flew on our way.

At last Pisa was reached, and as the day was too short for us to reach our next destination before dark, we decided to stay the night, and if possible see the leaning tower before dusk.

On the following day we had a comparatively simple flight over almost the whole length of Italy to our next landing place, Grottaglie near Taranto at the heel of Italy. Here we were most enthusiastically received by the Italian Commandant who greeted us the moment we landed, while in his trail followed one of the mess stewards, carrying a tray of bottles and glasses with all the requirements necessary for any cocktail that one might mention. We had travelled 500 miles or over 800 kilometres, and our host evidently considered that we needed fortifying. He himself mixed for us some wonderful brandy flip cocktails, whose main ingredients were eggs and brandy, and after partaking of them we all had a distinctly good impression of Grottaglie.

On the following day we set out on our trip from the heel of Italy to Athens, our route lying across the southern Adriatic to Corfu, along the Grecian coastline, and through the Gulfs of Patras and Corinth to Athens. On this journey we again experienced the difficulties of flying on the leeward side of the mountains when a gale is blowing, for the same north-east wind that we encountered above the Riviera coast was raging in the narrow passage of the Gulf of Corinth. Again we had to resort to our old tactics of flying low over the sea to take advantage of the evidently steadyng effect that the surface of the water has on the atmosphere when the wind is dashing down upon it.

From Athens we had a 480 mile flight over the sea, by way of Crete to Sollum on the African coast, and thence eastwards along the sea shore to Cairo.

Up to this time we had refrained from taking a cinema picture from the aeroplane during flight, owing to the many restrictions and regulations regarding aerial photography in the various countries we had passed over in Europe, but from the moment we arrived in Egypt, right through to the Cape, we were quite free to do whatever we liked in this matter.

Before leaving England we had taken a short experimental flight round Stag Lane Aerodrome, when Emmott had evidently imagined that all the facilities for taking pictures were quite simple and in order. Before taking off from Sollum we arranged that one of our first shots would be of the desert changing suddenly from the barren sandy waste to the rich fertile delta of the Nile, to be followed by a long shot of the Pyramids in the distance, after which we would take close-ups of them, and finally general scenes of Cairo before landing on the R.A.F. aerodrome at Heliopolis.

Here it will be best to explain something of the system of aerial photography, which, generally speaking, is of two kinds: vertical, which is taken from a special camera at the bottom of the aeroplane and gives a plan view of the ground beneath, and oblique, which gives a panoramic view such as can be obtained from any high hill or tower. On this flight we were interested only in oblique photography, both for cinema and still pictures.

It is quite easy to understand that unless the pilot places the aeroplane in the correct position, it is impossible for the photographer to get the picture, and this is still more the case when the photographer has but a very confined space in which to work, with hardly any traverse at all. Such was the position of Mr. Emmott and Mr. Elliott when working from the little cabin of our machine. It was so arranged that Emmott could take his ciné

pictures from one of the front windows of the cabin, thus getting a forward view, and that Elliott should take the still pictures with the ordinary cameras from one of the rear windows.

As we neared Cairo on a certain afternoon in December the day began to warm up and, because we had not cast our winter clothing and had just come from a very cold climate, we all felt the sudden heat, especially those in the cabin. On approaching the Nile delta I yelled through my little window into the cabin to tell them to get ready to take pictures, and then the fun commenced.

Whether it was that Emmott did not quite understand that it was necessary to wait until the pilot gave him the picture—for the slightest movement of the control lever would take his object out of view—or that neither he nor Elliott were used to working together in such a confined space, or that it was the heat of the day which overpowered them, or yet again that I was at fault for manœuvring the machine too fast, none of us seemed to know exactly. However, from the onset I could see that something was amiss in the cabin; no one seemed to take pictures when I gave the view, but film was being taken when I was not placing the aeroplane for any particular picture. I throttled down the engine and yelled further instructions through the cabin window amid the roar; the only effect that this procedure seemed to have was to darken the countenances of my two passengers, resulting in a further obstinacy to coincide with my manœuvres for aerial photography.

On nearing the Pyramids I thought that our chance had come for really fine stuff, and after banking the machine and struggling to the best of my ability for two or three minutes to get what I thought would be a magnificent view of this ancient Egyptian masterpiece, I yelled to Emmott to "take." On looking through the

cabin window I discovered that he had evidently given up the idea of photography, and was gazing vacantly at the landscape, while Elliott on the other hand instead of waiting until I had placed the machine in a convenient position for him, was evidently exposing film on a more or less blank desert.

This was my turn to become annoyed, for the day was hot and I was beginning to perspire in my winter attire through the exertions of banking the machine round and round the Pyramids. So I shouted through in my lustiest tones to Elliott to "wait for it" and to Emmott to "take," "take," "take."

Instead of stimulating Emmott to action and modifying Elliott to patience, the effect of my shouting had the most alarming results in the cabin. Two perspiring faces turned round and scowled darkly at me, then scowled at one another; then above the roar of the engine I again shouted to explain matters, whereupon they shouted, and for a few moment a perfect inferno raged.

It dawned upon me that possibly I might be to blame for not having arranged with my assistants beforehand and impressed upon them some sound system of co-operation for the aerial photography work, apart from the scanty chat that we had on this subject before starting. Giving up the question of aerial photography for that day, I headed across Cairo for Heliopolis and landed on the R.A.F. aerodrome.

When the machine came to a standstill, I quickly divested myself of some of my outward clothing and was about to explain matters to my crew, when I discovered that both of them, looking very hot, limp and exhausted had no particular desire to talk to me. However, that was shortlived, because the machine had to be put away and the general routine of the day's work gone through,

and in the quiet of the hotel that evening we rehearsed with cool and collected heads exactly how our photographic work should be done in the future.

We came to the conclusion that only under exceptional circumstances would Emmott taking cinema film and Elliott taking still photographs be able to operate together at the same moment; I was able to convince Emmott that it was useless for him to try to take pictures until I gave him the view, and that it was the control lever of the aeroplane which really traversed the ciné camera, and kept the view in the sights, because an aeroplane is controllable in three dimensions, the slightest movement of the control lever can make the nose fall or rise, and the wings go up or down, while the rudder can swing the machine to the right or left.

Having ascertained from practical tests with Emmott exactly which view I should have to get from the cockpit at the rear of the machine to coincide with the view that he would get from the front window of the cabin, all was O.K.; I already knew which view I must have to coincide with Elliott's back view from the cabin. Two days later we started off on a short flight over Cairo to film the Pyramids properly, and on this occasion our system worked perfectly. Having decided who should take the first picture, I yelled through to the cabin, "Emmott, prepare to take," whereupon he would turn the handle as soon as the object came into view, and I would do my utmost to keep the object within his camera sights, at the same time placing the machine so that the sun would throw up the best shadows. Then Elliott would be warned and the machine would be placed for his particular view; in this way the procedure was carried out systematically until the subject had been covered by both ciné and still camera.

We discovered a novel method of filming the Pyramids, keeping them in the picture by a system of side-slipping on to them. Owing to the fact that Emmott was taking his film from the front windows of the cabin, we shall be able to give the public a fine view of the Pyramids looking like tiny piles of masonry from thousands of feet above, then through side-slipping down on to them they gradually get larger and larger until at last they fill the picture—the moment when we had to turn away or side-slip into them.

At Heliopolis aerodrome we were given a wonderful reception by members of the Royal Air Force, who did their very utmost to facilitate our flight to the Cape; my eternal thanks will always be to those officers and men who helped so greatly in the distribution and shipment of my supplies, and to those at H.Q. who had worked up for me so much valuable data regarding the flight ahead.

After nearly a week in Cairo we took off and flew on down the Nile, over the land of the Ancients to Luxor; for Emmott was keen not only to get aerial views of Thebes, Karnak, the Temples of Luxor, the Valley of the Kings, and the Ramasseum, but also to get ground pictures of the relics of the Ancient Egyptian civilization.

Then came a short flight from Luxor to Assuan, where we had the opportunity of filming from the air that masterpiece of British engineering, the Assuan Dam, which stores and controls the water of the irrigation scheme for the whole of Egypt. After this we flew on down the Nile, which from Assuan to Wadi Halfa is turned into one great reservoir, and after spending the night with the Governor at Wadi Halfa we passed on over the Nubian Desert; with ideal weather conditions and perfectly calm atmosphere, we followed the railway across the desert until its meeting with the Nile again at

Abu Hamed, and a little further on we landed at Atbara. Atbara is the headquarters of the Sudan Government Railways, and it was here we landed on what is possibly the largest natural aerodrome I have ever seen. It consists of flat, hard, natural desert that seems to extend for miles in every direction.

In these few pages it would be impossible to tell our experiences on every portion of the flight, so I will hurry on to some of my most striking impressions of the journey.

Just before arriving at Khartoum we had the somewhat impressive picture of the meeting of the Blue and White Niles, and here it is worth noting that from this point the wonderful river flows about 1,500 miles through the heat of the desert without a single tributary to augment its waters except the River Atbara, which only does so at flood time.

We spent our Christmas at Khartoum, and before the old year had departed we flew on our way southwards to the next landing ground at Malakal. Daily I became more impressed with the enormous opportunities of a great commercial airway that would link up Central Africa with the Mediterranean. Here was a country where it would be possible to maintain a 100 per cent. efficiency regularity, and at the same time do a trip in two days that by the present modes of transport takes over three weeks.

At Malakal we landed beside the river on a strip of ground that had been specially prepared but a few weeks before. On the borders of the landing ground was a village of the Shulluks, the natives of this part of the Sudan. In order to give our machine as much protection as possible from any gales that might occur, we drew it close up to their huts; curiously, they showed no interest

whatsoever in our aeroplane, and I was told they looked upon it as "one of the mad things the white men do."

One of the officials told me that an improvement at which these natives really marvel is the installation of water in pipes. For centuries their womenfolk have journeyed night and morning from the village to the river bank to fetch water, and when water pipes were first laid it was a common thing to see natives gathered round the tap, while one, a little more courageous than the rest, would turn the tap and let the water gush out; this to them was truly marvellous. Water was something that they understood and was the main part of their daily existence, so when it could be obtained merely by the turning of a tap, that indeed was something wonderful. As for an aeroplane, as far as they were concerned it was simply some madness that was not worth considering, or perhaps it was entirely beyond their comprehension.

On my return journey I landed at Malakal, and the Chief of all the Shulluk tribes happened to be present. He was quite interested in the aeroplane, but I found it impossible to explain to him the distance in mileage that we had come from the Cape in a matter of six days. My interpreter told me to measure it approximately in days of walking, and so, working on the basis of walking continuously about 20 miles a day, I reckoned it would take roughly a year. The interpreter explained to the Chief that we had come a year's march in six days, and I shall never forget the expression on the poor old boy's face as he put his hand to his forehead and shook his head—it was far too much for him.

8. TRAVELLING THROUGH IRAQ AND PERSIA.

THERE are lots of people in Bagdad and out of Bagdad who will tell you that the days of Haroun al-Raschid are gone; that the only monument to them is the tomb of the Lady Zobeide who might have saved herself quite a lot of trouble by dying earlier.

"How," they will ask you, "can the customs of Mohammed survive when the local Arab gentleman has taken to wearing a forage cap and calling himself 'effendi'; when he takes his whisky like a man at hotels called the Maude and the Waverley; when the Anglo-Persian Oil Company has one of its headquarters in the heart of his lair; when the successor of the Caliphs, King Feisul, serves lemonade to diplomats at banquets?"

They say the whole town is dotted with British soldiers, air force lorries, sporting dogs, Fords, bars for non-commissioned officers, soda fountains and newspaper shops where the *Times* and *Boxing* rub shoulders. Where are your Barmecides?

When we had sizzled through Ana (on the banks of the Euphrates), which claims to be the longest village in the world; when we had watched hundreds of frantic Mesopotamians flapping their washtowels (and failing the possession of those useful cloths, their shirts) in a frantic attempt to scare away the locust cloud from their grain fields; when we had passed unnumbered waterwheels and taken dozens of salutes from the trim red and khaki garbed native police patrolling smartly with their rifles; seen Hit and Ramadi and slept a night in a graveyard

sadly disturbing the jackals, we viewed Bagdad for ourselves.

The first impression I formed was that the clubmen were right. The names of British generals were everywhere; attached to hotels and garages and streets. British flowers blew in gardens under waving green palm trees. The main thoroughfares were wide. And staring us in the face at every corner was the contents bill of a London Sunday newspaper, which bore in large, black capital letters the anguished words:

"CONDEMNED MAN'S WAIL FROM CELL."

Who would expect to find Abou Hassan the wag in such company? Yet when we were established in the cool persian house of Mr. Rice, the manager of the Anglo-Persian Company, and had bathed, and breakfasted on English food, and been generally pampered and overwhelmed with hospitality, the very first person I noticed was Abou Hassan himself waggishly strolling down the middle of the footpath to the supreme inconvenience of everybody, with a kadi beside him and seven donkeys, with embroidered saddle-bags that might well have been magic ones, for a background. It is true that he had modernized himself to a certain extent. Though he wore a yellow robe, he was wheeling a handcart which had Dunlop aeroplane wheels that undoubtedly came from Birmingham, and a pair of military boots, which he certainly had not adopted for comfort, decorated his feet.

gusto. Then Sinbad the porter came along.

All through Asia the porter is an established institution. No perfect gentleman ever carries anything in the East. If you buy two tins of benzine in a jostling bazaar, a porter will be at your elbow to throw them over his peculiar saddle and bear them a mile or two for a few piastres or annas or whatever the smallest denomination of the local coinage happens to be. No load ever daunts him. He is bred to be a beast of burden, and a beast of burden he is.

Whenever you go beyond Suez, the road is full of porters—spindly, shank-and-bone little men who look as if they would be incapable of carrying a grasshopper which had eaten much grass, yet cheerfully bowing their shoulders under loads one glance at which would send the whole of the Australian Wharf-lumpers' Union off into a long stop-work meeting. You can hear him crack as he raises it from the ground in his own inimitable way. You look back at intervals with cold fear in your heart that you will see a large bale resting on the ground with the mingled pulp and blood leaking slowly from under it, but those palpitating legs are still ambling forward at a pace almost equal to your own.

In the East usually, the big man does not labour. Almost invariably from time immemorial he has made his living either by looking magnificent as a profession, that is by lying under a tree and making his wife keep him; or, if his opportunities are more expansive, by going into politics or embracing some other occupation in which he can force the other man to work. Ergo the rickshaw man and the porter and the labourer (who is all too often of the feminine gender) is small and skinny and wistful.

Only Sinbad the porter of Bagdad is an exception to this rule. He is a Kurd, usually about six feet five

high, and he sports a huge moustache in the middle of a forbidding countenance.

He has been a feature of Bagdad as long as the black-bearded, shaven-headed old fellows who frequent the street of the silversmiths and the crowd upon crowd of merchants who line the footpaths cross-legged on cane sofas and lounges, smoking their hookahs, sitting "in receipt of custom." He scorns small loads—those he leaves to the little, yellow, basket-carrying coolie boys. No ladies' shopping parcels for Sinbad the Kurd. Give him the six-cylinder Fiat motor engine which I saw him carrying or six tins of benzine lashed on a board and he frisks around like a young lamb in spring, bumping into everybody, discommuning the donkey teams in the narrow alleys and knocking corners alike off the streets and the obstructing population.

If, however, you would see him at his best, you must not become angry or grow inclined to physical argument with him. If you attempt this latter he will drop his bundle with a loud howl of fear and anguish and become a miserable, shrinking whining wretch like any other poor devil of a beast of burden. Allah, when he gave the Kurd porters so much muscle, had no room left to fit in the courage.

3

Yes, all the heirs of the "Arabian Nights" characters still flourish in Bagdad. Some of them have disguised themselves in the semi-military dress of the new generation of effendis. A good many have degenerated as you will become apprised if you read the newspaper reports of "rousing speech by the Sheik ul Hubble Bubble" in the new Iraq Parliament. A few have ruined their com-

plexions and their reputations with courses of Paris and champagne, and quite a number, under the guidance and direction of Sergeant Whatsisname, who is a power in the land, have grown into very efficient policemen.

Behind all their masquerading, however, you recognize them just the same.

The most prolific of them are the sons of Abou Mohammed the Lazy, who, on the basis of the soundest sort of evidence, one's own eyes, married many wives of assorted colours and has produced a variegated flock which, to the last man, is astonishingly competent at sleeping under a palm tree. When there is no palm tree (though they seem to prefer one), anywhere else will do. They can sleep almost equally as well on the steps of the gorgeous mosque with its blue and green variegated dome, the most beautiful thing in Mesopotamia; or on one of the two boat bridges across the Tigris; or in a gharri or a barber's shop or a bank; or under the lee of a mud wall or on top of it; even on a camel the true Bagdadi can and does relapse into a gentle slumber. And, as you soon discover when you come to deal with the Government offices, he has learnt the art of working with his whole consciousness wrapped away from the realities of life in the fluffy cotton wool of a daydream.

The King and his sheiks believe that they are the Government of Iraq. Some of the very young British officials who have only been out three months believe that England controls the situation, but actually the ruling class is an aristocracy of caste made up exclusively of the offspring of Abou Mohammed. Their influence, of course, is purely negative. Rest, as it is understood by Europeans, would be regarded by them as hard work. It is they who have made the new Civil Service an inert, listless, whispering thing wherever there is not a British

goad urging it to effort. It is they who are responsible for the continued barrenness and wastage of the amazingly fertile silt lands along the two great Mesopotamian rivers, which once produced so prodigally as to support Babylon and Nineveh, perhaps the only two cities which ancient history ever knew comparable in size to the great capitals of modernity.

Of course, most modernists and reformers desire that all Arabs, Asiatics and Pacific natives who are given to lying on their backs and making a day's work out of watching the birds, or sitting on a donkey, watching a blowfly playing round its ears, or lounging on a coral reef doing nothing whatever, should have thorough elementary educations so that they will disown Abou Mohammed and burn to emulate Henry Ford. But, as one looks at them, one is prone to wonder whether they are not the wiser. At any rate, when they are not sleeping they are mostly singing like children in sheer enjoyment of their own sloth. I know about a thousand captains of industry who have four meals per diem more than my friends of the Garden of Eden, each meal being about a week's rations for a Bagdadi of the baser sort, as well as houses, motor-cars, votes, factories, wireless sets, wives—official and unofficial—and always a bottle in the cupboard to celebrate occasions. I have never heard one of them carolling in a main street at five in the afternoon. On the other hand your allegedly poor, down-trodden Oriental peasant will sing at any old hour in public places if the fit takes him, with the voice of one who has not a responsibility in the world. Anyway, the climate of most of Southern Asia is enough to make anybody lazy.

In Bagdad its effects are such that in summer all business begins at 6 a.m. in European houses, and, with a break for breakfast at about nine, continues till 1-30

p.m., when it finishes for the day.

Iraq is not the only territory that has learnt this wrinkle and some of our Pacific possessions might well copy it with good results—the New Guinea Mandated Territory, for instance. It would give the white population more time for poker, which now has to be crowded into the hours of darkness.

In the afternoon, most Europeans with sound sense take off their shoes and join the Abou Mohammeds with such enthusiasm and regularity that I felt as if I were performing an act of cruelty when I announced that I proposed leaving the city of the Barmecides at 3 p.m., one afternoon.

Garage men had to be routed from their sleep and, as we passed through the lanes, numerous somnolent people under the shelter of mud walls rose hesitatingly as if they were saying to themselves :

“ Now, is it worth while getting up or shall I let myself be run over? Oh, well, I suppose these confounded new Indianized police would arrest the poor fellows if they killed me, so here goes! ” Whereupon, they would pull their legs into safety with protest written all over their countenances.

I had hoped to make Khanikin that night out from the capital, but I had reckoned without my brigands. In every country from Hungary onwards, I had been told about the brigands of the next land ahead, but experience proved that the only States in South-Western Asia which treat their brigands seriously are Iraq and India. Jugoslavia accuses Bulgaria of having a fine crop, but Bulgaria has never heard of them. It has heard, though, of the

Turkish ones who appear to have all joined the Civil Service or gone into the benzine trade. The Turks themselves have fearsome tales about Syria, and the Syrians, while admitting that there are plenty of places where one may be shot up, declare that their villains are Turkish educated. Bagdad, however, apparently has good reason to regard its highwaymen with respect.

The local officials have not been immune. There had been one case a few weeks before we arrived in which a man had been taken out of his motor-car and carefully tied up while the gang held an earnest debate as to whether it would be better to cut his throat or let him go. In the end, they let him go. Another lot, operating on our road to the Persian border, also allowed the local doctor to go home—in pink—and it was said that he was very much annoyed about it.

One of the results of all this was that when we arrived at Shararabad, which possessed a walled police fort, the native police officer turned sickly grey at the thought of our proceeding at night, and intimated that if we left so much as our noses sticking outside the high *pisé* wall of his fort, the ill-disposed persons who inhabited the village nearby would probably steal the skin off the end of them. As the car could not be got inside, he put an armed guard on it, and so little trust did he have in his neighbours that he made a hullabaloo when I strolled a hundred yards away from shelter to get a better view of the sunset. I fancy from later information the police grossly exaggerated the danger.

In the morning I was awakened by a loud bang a few yards from my bed and looked round to see the whole of the smart lot of tall fellows who formed the garrison with smoking rifles. Francis, who had got up a little earlier and was outside attending to the car, came in so hurriedly

that I imagined he thought they had shot me. I, for the moment, in my half-dazed state, rose with a flying leap under the impression that the brigands had arrived, but it was only a cobra hunt, which gave us a few exciting moments in an otherwise lazy, restful day, most of which we spent at Khanikin as guests of the Anglo-Persian Oil Company.

An Anglo-Persian Oil Company bungalow in these regions is like the old-fashioned Australian station. It is Liberty Hall with a vengeance. It is always full of wayfarers who have announced themselves by telegram, and casuals on the way "home" to leave who haven't, and there are inevitably a few agents and oil diviners and political officers hovering round who "drop in," and after the free and easy manner of the Anglo-Persian exile, casually order breakfast or whatever meal is just finished.

This particular bungalow lay at the end of a street which was wide enough for one vehicle and behaved, during its progress to its destination, like a hastily levanting snake which has parts of himself round several different corners at once.

Once there, a large Persian mud house faced on to a yard. On the other side, its windows opened straight above the river which runs through the heart of Khanikin, from the gently sloping sandy banks, of which little boys, stark naked, popped in and out of the waters which came down with a rush between the interstices of a graceful Arab stone bridge set against a lovely background of unbelievably green palms and smoky grey hills. It was an interesting view and the bridge had its romance. According to superstition, a certain young lady of Khanikin told an ardent lover that if he built a bridge across the stream she would marry him. Manlike he built it; womanlike, she jilted him. But, as with all good romances,

there was something wrong with the authenticity of the tale.

In the first place, stone-cold history allows the bridge only a modern origin. In the second place, Khanikin even yet lives in an age where father is the dispenser of daughters (for the usual consideration). We debated this matter rather lazily and cynically during the afternoon with a political officer and another visitor who accounted for the flow of strange but essentially useful oaths with which he seeded his conversation, by the fact that he had a brother connected in some way with the Australian Commonwealth Parliament House staff.

On adjourning to the roof, which, like that of all the houses hereabouts, was flat, and having met the household storks, I passed a resolution all by myself that, facts notwithstanding, the romance must be true. It should have been even if it were not. Viewed with Father and Mother Stork placidly standing each on one leg over their nests on the unprotected corner of the roof, the landscape was more than ever entrancing. On the other roofs nearby, other storks were regarding the scenery with a stolid but serene solemnity. The natives, hereabouts, name them Hajji Lak Lak—Hajji being a very holy man who has become important through having been to Mecca and thus acquired a right to dye his beard red with henna, 'lak lak' because that is a slang term for a long, serious, cadaverous person. They were very fascinating birds and I had often before spent half an hour spellbound and wondering how anything of flesh and blood, especially when it is able to catch and gobble with such rapacity, can maintain their hour-long marble immobility, when they are guarding eggs.

Before we left the next morning, I climbed again to say good-bye to this couple. They were in exactly the

same state of rigor as the previous evening and all their nesting companions on the other roofs were equally immobile and unconcerned, despite the fact that most of Khanikin, which sleeps on the top of its houses for coolness, was folding up its beds and scolding its children and putting on its shirt in preparation for another luxurious day of sloth.

5

From Khanikin you see the Persian hills. They are unimposing and bare. The more distant ones might match with some of the lower Australian mountains or some of the English greater ones, but there is nothing to tell you that within a couple of hundred miles you will have left the smiting furnace-heat of the plains and be watching a teamster eating snow on the top of the Azdabad Pass. While you are speculating as to where the snow passes may lie, you come to the border, Iraq Post and Persian Post separated by a few businesslike foothills which used to be considered convenient by the brigands as a rabbit warren to escape into after they had raped a caravan.

The Iraq Post was busy, but its chargé d'affaires, a large and jovial Civil Servant, one Mirza Ali, was not too occupied to ask us to add to his museum of photographs of travellers across the border which almost completely covered his walls.

The Persian Border official was busy in another way. His *ménage* was one of the most discouraging-looking outfits man could conceive. The building in which he was housed was low and flat outside, while in the heat before it stood restless packteams of mules and ponies all jumbled up with Fords and motor-lorries and camels jostling each

other, what time their drivers cursed the fair land of Persia and each other and the rather disreputable Persian customs officials. Black fez and dusty white turban quarrelled merrily and inside, everybody seemed to be in complete disorder until one's eye sorted the situation out, when it proved that they were all getting through their work with expedition. We ourselves certainly had nothing to complain of.

The French-speaking official in charge said: "Customs? Oh, yes, I have heard of you from the Tehran authorities."

He handed a blank sheet of paper across the table to me.

"Please write me your personal guarantee that if your car is burnt you will pay the Persian Customs 600 krans."

"That won't be much use to you if I get killed."

"All I need, sir," said the customs official, "is your word as an Englishman. If you die your relatives will undoubtedly pay."

"Well, you had better read it over and see that it is satisfactory."

"I am sorry; unfortunately I do not read English well. I must take your word for what you have written."

Evidently, even though England was forced to drive the Germans out of Persia by invasion with the Dunsterville force, her prestige is high in that queer country whose official language is French, though its own language is itself the French of the East and the official tongue of many Indian States.

As we crossed the border, we learnt the reason for the heavy traffic which appeared to be banked up on either side of it like flood waters along a levee. The pilgrims were on the move for Mecca. From all parts of the East, not to say of the world, they were travelling in the blazing

spring heat by land and sea, as their need drove them. Kasr-i-Shirin, the border town, was full of them—rather entertainingly full, since at this point the two great sects of Mohammedanism and some lesser ones appeared to have met territorially.

The quarrel between the Sunnite and Shiite sects is not a new one. It began about twelve hundred years ago over the right of Mohammed's relatives to divine succession in the Caliphate (the Caliphs, of course, being the heirs of the Prophet to the headship of the religion which he founded). The Sunnites denied it and the Shiites supported it. For a Sunnite to voice his views in some parts of Asia, was, until quite recently about as safe as for a Cork Irishman to walk the streets of Derry shouting "Up with the Pope," and trailing his coat-tails in the dust. Therefore, Sunnite and Shiite do not greet each other with even outward cordiality, if they are true to their sects.

Their difference was most fortunate for England during the war, because the German propagandists agents of "Hajji Wilhelm" of Berlin, who otherwise might have done harm of immense extent, were saddled with the inconvenient necessity of being Sunnites in some places and Shiites in others; which was horribly awkward for some of them when they were found out.

However, here were all the Shiites (and a few Sunnites) with their household belongings being packed for transport in motor-lorries. Some of these vehicles were also carrying large loads of benzine; some were long buses with a double row of seats with strong wire netting instead of walls to prevent the mess of pilgrims inside from bursting into the open air and falling upon the road. Why the seats were there none could say, because there was no room to sit on them.

Mr. Ryan, a reddish man about thirty, was ushering his passengers to their places or, to use his more apt expression, "packing" them. It was evident that Mr. Ryan did not speak any Persian, and none of either the Sunnites or the Shiites had any English, which seemed to be a splendid arrangement for everybody, since nobody could effectually argue. While I was lazily amusing myself as we waited for some Persian money, turning over in my own mind whether Mr. Ryan himself was a Shiite or a Sunnite—*i.e.* whether he adhered to Rome or was of the Methodist branch of the Ryans—an inward debate which followed logically on an effort to distinguish between the Mohammedans, I heard him say in his quiet voice:

"Now, move up, will you? Now go on, do you think you've bought the whole bus? Go on, squeeze up!"

He pushed violently upon the struggling mass which was trying to arrange itself and its sleeping rugs, bags, pots, pans, umbrellas and other paraphernalia.

"Squeeze or I'll knock you! Dinkum, I will."

Immediately the memory of a strange rumour which I had heard in Khanikin came back to me.

"Hullo, Aussie. Where did you hail from?"

"Born in Redfern, lived in Coogee," said Mr. Ryan laconically, still moulding his passengers. "Now, I'm telling you! You stay where I've put you or I'll knock you! Too right, I will."

The bearded old fellow whom he was kneading into position "stayed put." He looked as if he thought it safer, whereupon our fellow-countryman had time for conversation. He was not excited at seeing us—perhaps he had seen too much in his short life to be excited about anything. Possibly, too, we were not exciting. We, however, were excited at seeing him, especially Francis, who had long ago come to the conclusion that the Austra-

lians are the only white men on earth. Mr. Ryan had come out here to the war and had remained here. It was a good enough pozzie he said, though he could do with a surf on Saturdays and sometimes he thought of going back home. But how, he demanded, was a man to pick up, in Sydney, the fifteen to twenty quid a week that he was earning on the Persian border in the interests of the oil industry and the great Mohammedan religion? Would we tell him that?

"Go into politics," I suggested.

"Urr-h," grunted Mr. Ryan. "Well, now everything is jake with the menagerie. I suppose I must be getting. His engine roared casually on three cylinders. His unwieldy vehicle gave a heave. Such of his devout and patient cargo as had room to bend threatened to break in halves with the impact of his first plunge towards Mecca.

"So long, digger! Have one for me at the Barley-mow!"

The other drivers told us he was a good sort.

"Of course," they said, "he hasn't learnt the language like the rest of us and he only has a second-class driver's licence because you can't get a first-class unless you've been through a Persian motoring school. But he gets there all right, and drive, my Lord! How he can drive!"

Stowing about twelve pounds weight of enormous silver tomans and enough notes to paper the county of Cumberland into my breeches, what time Francis looked on gleefully at my struggles, we went to the inner Persian barrier where already a number of Kermanshah-bound Fords were lined up. In a few minutes we were racing them towards the heart of the ancient and romantic land of Iran.

It is singular how much difference a mere national line drawn across a map may make to the character of the country.

On one side of the Persian border the country-side is distinctly Mesopotamian. The costume is, in main essentials, Arabian among the old-fashioned, and post-war Irakian among the new. The landscape has the features which have distinguished it since the days of Nitocris.

Through the barrier everything changes. Types which you have hitherto seen only as odd travellers, in black Astrakhan headgear or in real Persian costume, potter about in rich profusion. There is not the brilliant show of colour in Persia that there is in Aleppo or Bagdad. The Persian believes in more sombre hues. He wears on top, usually, unless he is a Kurd or an old-fashioned Parsi or one of the turbaned tribes, a round black or earth-coloured fez which is the shape of a witches' cauldron without the rim at the neck. Below this, he has bobbed hair and a confusion of garments, according to the coldness of the region he is in, the whole basis of which, in any case, is a blue dungaree tunic and a pair of Oxford bags made the wrong way upwards of the same material. Anchored at the ankles, in the interests of decency and warmth, they have a loose, flowing effect above and below them are turned-up shoes.

The Persian shoe is a wonder in itself. Its upper part is made of a tough, twilled white cloth and it has a thick, blue-green sole. At first glance you would imagine that this is of mineralized leather, but on closer acquaintance it turns out to be constructed of innumerable strips of treated cloth, so packed together that the surface looks like a solid piece of smooth material. The heel and toe

are protected with horn guards, and I can testify from experience that even the cheaper sort are as substantial and wear just as well as an ordinary leather boot and that, wearing them, one is a good deal more comfortable and sure-footed.

The Persian is a queer fellow. He is dirtier than the Turk. Even the better-class Persian believes that to have more than one shave a week is luxury. His clothes among the lower classes are shabbier, but as the Turk has been Europeanized a year ago and compelled to acquire new costumes and the Persian has, no doubt, had his wardrobe for a good many years, it is possibly unfair to judge between them. He looks as if he had dressed to make himself humorous with his unshaven face or stubby, often red beard with the grey or black edges forming a halo between his skin and the dye. He wears a perpetual smile. He lies about less in the shade than the Bagdadi, and you are apt to say when you see him, whether as a Mede along the Alvand Range or an old-fashioned Iranian further east, that he is an easy-going fellow as loose in his habits as in his language, which, colloquially, has less grammar than any other tongue in the world except Chinese, and is as simple to learn in its elementary form as Esperanto—in some ways far simpler to the Oriental. You see the Mede to best advantage in Hamadan, which is one of the oldest living cities in the world, a capital to which Semiramis gave a water supply and in which Darius and Xerxes flourished; in which Alexander the Great held many a debauch; from the walls of whose temple of Æna, Antiochus the Great retrieved the last gold bricks and silver tiles.

You might expect to find the Persian there a proud fellow bolstered with much tradition and many precedents of conduct. However, you ask him in vain, it is said, for

any legends of the ancient greatness when Medea was the centre of the force which overthrew Babylon and laid the shadow of its dominion over all the lands from the Ægean to the Afghan border of to-day. The few stories that have survived locally are of Alexander the Great, whom they call Iskander and of his frequent and glorious sprees. The Persian never forgets a spree. Otherwise, so far from remembering the great things of old time, the citizen of to-day cannot even read any one of the references to Ecbatana written in B.C., many of which, descriptive of the lie of the land, might have been indited yesterday.

There is one written 2000 years ago telling of the posture of a great fallen lion which lies beside the Ispahan road and it is accurate to-day; but the local inhabitants credit that lion with being a mere youngster set up in the Middle Ages by Tamerlane when he conquered the place.

Then there is the even more painful case of the Ganj Namah inscriptions, cut deep into the rock in a sort of natural temple in the Alvand Ranges by Darius and his son Xerxes, 2500 years ago.

"A great God is Aurangazda who created this Earth, who created Heaven above, who made man, who gave peace unto him, who made Darius King, the one great King among many, the only great ruler among many. I am Darius, the Great King, King of Kings, King of the lands which have many peoples, King of the whole earth even to its borders, the Son of Hytaspes the Achaemenian."

The people of Persia, the folk classes, seem to have forgotten Darius and his tradition. They think this inscription refers to some hidden treasure as the name they give it testifies.

They have forgotten, also, in Hamadan, that fine, fertile-brained "citizen of the old school, Astyages.

Anyone who knows his Herodotus must have been fascinated with the forthright methods of Astyages, grandfather of Cyrus, who, having ordered his courtier, Harpagus, to murder the future conqueror of a good deal of the world while still an infant in arms, found out thirteen years afterwards that the order had not been obeyed.

Naturally he was angry at such a show of merciful laxity on the part of his minion and had him brought before him. Naturally, also, Harpagus being a perfect gentleman, apologized for his disobedience. No doubt, too, his personal knowledge of Astyages' technique in such cases was a distinct incentive to meekness, and he was pleased to find his master in a lenient mood.

"Oh, that's all right, Harp," said Astyages when he had heard Harpagus's regrets. "Now I've got him I'll keep him. Let bygones be bygones! Send your son along to have a game with the lad this afternoon and drop in yourself to dinner. Don't worry to dress; only the family present."

"Nice bit of lamb you've got," said Harpagus a few hours later, "not merino, surely? Some of those new Armenian crossbreds, I presume?"

"No, local bred. Have some more! How's your glass, old man?"

"Pretty right, thanks. My word, this meat is prime."

"Had enough? Sure? Well, would you like to take a bit home to the wife?"

"That's awfully good of you, Your Majesty. Certain you can spare it?"

"Oh, quite, quite! Hey, Cambyses, bring in the rest of that lamb that Mr. Harpagus has been enjoying!"

And, the butler returning, Astyages presented his guest with the head and feet of the son whom the latter had sent to play with young Cyrus that afternoon.

"Very tender, wasn't he?" said the King, to the naturally aggrieved father suavely. "Glad you liked him enough to have a second helping. Perhaps it'll teach you that when I ask you to strangle an infant you've got to do it. However, no bad feeling! Always glad to see you on Saturday night, but you'll have to excuse me now. I have to see about the flaying off a few captives."

7

Looking at the modern Persian with his smiling face you would say at first glance that the grand old spirit which was the mainspring of romantic tales like these is quite dead. But recent history and your own ears in time contradict your first impression.

Within the past ten years Persia was burying brigands alive with only their heads exposed or taking them to the market place and there, with hooks in their nostrils to draw back their heads, cutting their throats in the face of the crowd. A man who travelled Persia fifteen years ago told me that at one place he encountered brigands nicely cemented up in pillars of gypsum and left in the sun to die; and an unfortunate criminal who had been immured feet first in mortar and others who had merely been hamstrung and had their hands lopped off under the First Offenders' Act.

Tentatively, at any rate, the British influence succeeded in doing during the war what Russian influence had failed to do before it, and checked this sort of horror. Now Reza Shah has set the seal on reform and established something like official responsibility. Under the old regime, it was only the brigand and the thief who were punished. Now, the stand of the Government is: If there are brigands, there is provincial incompetence. And

in the horse-ridden and road-senseless streets of London or Sydney in 1890, all the relatives of the deceased will declare a blood feud against you. And the only recipe for safety when you become qualified as their victim is to fix your eye on the nearest point of the Persian border and to get there before your pursuers.

"If you kill any Persians or are caught photographing their womenfolk," said our kind adviser in Bagdad, "don't wait to report to the police. Get into top gear and keep going until your petrol"—Bagdad is where "Benzine" becomes "Petrol" again—"until your petrol runs out.

"Then fill up with petrol again and don't stop for anything less than a loaded field gun until you are well into Baluchistan."

Several times I thought we should need the advice.

8

The first thing one notices on leaving the plains for Upper Persia is the transport development which is going on.

The politics of the country are still a little mixed, but, inspired by the example of the great military highway which the British built from the Tigris to Tehran and then on to Meshed during the war, Reza Shah has begun to open up the country with good roads. He is also framing a railway policy, incontinently dismisses officers who march out of step on parade and has shown a fairly firm attitude towards the Bolsheviks whose shadow hangs over his country all the time. He was marching not undisciplined troops towards the northern border while we were there what time he debated with the Soviet Persia's trading privileges.

He is able to give the Germans flying passenger rights

to Berlin *via* Moscow and maintain some semblance of impartiality between the conflict of interests represented by the Anglo-Persian Oil Company which has made Persia rich and controls the greater half of the country's exports and his American advisers who, with Standard Oil and California at the back of their minds, no doubt, would like nothing better for a birthday present than the news that England had lost her oil concession.

Altogether, Persia is progressing, but at every step you see evidence that a few years ago it was in the Middle Ages. Thus, as soon as you have climbed the Azdabad Pass and made the high, hot-cold, rare-aired plateau which has even a more deleterious effect upon the constitution and the temper than the sweltering plains of Babylon, every town from the outside looks neat because it is surrounded by a high, forbidding wall, even though inside it may be a labyrinth and an abomination.

9

Most of the country-side to Kirman across the route from Hamadan which we took after we had climbed the mountains with their tortuous sweeps of good road and their fearsome precipices and their hairpin corners blocked usually on the nether side with wide waggons and bucking mules and bullocks, is easily described.

It is not unlike the higher parts of Asia Minor, only that its bones have been picked cleaner. The earth is mostly peppered with small stones or hidden in places with henna plants or salt-bush. Shepherds feed their sparse sheep on the hill-sides. The yellow grey, inward sloping square walls of towns and hamlets rise every few miles with, now and then, the dome of a mosque, or square, tall, bare wind towers projecting above them. The in-

evitable poplar is to be found beside the streams. There is tamarisk on the desert edges.

Across the plain or the valley the mirage lies like a sea, steel-blue water in which camel train and donkey pack and the mules which form gnizzly funeral caravans (in which the coffined dead of lonely villages travel to holy places) achieve an appearance of sailing motion. Out of the sea rise little mounds which are the well heads of the kanats, the shafts reaching down to the underground channels in which the Persians, throughout their barren country, guide limpid, subartesian streams to their towns.

You pass from hill to hill in a blazing, shimmering heat by high-walled khans full of dozing camels and tale-telling camelteers; you whirl through villages while the police, dressed in blue uniforms and shakos reminiscent of Napoleon's Old Guard, chase you, pleading for a ride. Outside, the water channels slow your pace, for they are banked high every few hundred yards across the road, which is an earth track conventionalized by caravans and marked with the spoor of rare Fords. The wind blows in your face and there is suddenly a scent of wet places, of crop and of flowers.

Dreaming? No!

From where you swelter over bully beef and milkless tea at midday, a sort of mist sits on the land against the mountains. Nearer, along a sweep of road, it grows into a line of green. Fields open up. Where there has been only salt-bush and mirage, the earth is carpeted with closely packed wheat and barley, as green as Ireland.

Each field has been raised above the level of the road with accretions of fertilizer and rich soil, and a stream of limpid irrigation water runs along the border. Poplars and birches wave; next to the wheat is a meadow of flowering poppies; more wheat; great round pigeon towers

full of blue-grey fluttering birds; acre upon acre of scents that seem more pungent after your days in the deserts. Then, dilapidated walls behind, you are in a narrow street, teeming with bazaars and excited policemen while the crowd tries its medley of languages on the dog—yourself.

A guide comes on board and you go to the British Consulate. You know what it is like because all British houses in Persia are the same. High walls, garden and pools of clear water, waving trees and running streams; the odour of the rose and the poppy and the iris blossoming and a very ordinary-looking young or old or middle-aged Englishman living in an immense, cool, white house, with all the appanages of civilization around him, and a decanter of whisky on the sideboard. Enough servants to satisfy King Solomon stand about in long black coats and witches' cauldron fezzes, the black of which is relieved by the silver semblance of the British royal coat of arms.

Hurrah! This is royal Ispahan, home of romance and polo, which they are spoiling fast with traffic police men and Ford motor-buses and with the cutting of a wide main road which is being pushed out to Yezd, so that it will presently connect Central Persia with the Indian railhead. It has ceased to be remote. No longer do they pelt you here with dead cats and filth as they might have done a few years ago. Their mirzas are anxious for British motor-car agencies. They talk of progress and irrigation, and the splendour of the days when the Shah's brother sat here as a sort of King—"the shadow of the Shah" he was called—and the city was a maze of holy places splashed with blood; is gone for ever.

Through a welter of narrow streets, all pedestrians and corners round which the astonished donkey trains have to turn and flee from you, over canal bridges where a swerve of six inches means death, through rumbling

soukhs and passages; and you are out once more on a parched, water-channelled plain, with the stony, salt-bush-nubbled country-side and its hummocky irrigation kanats around you with the same old donkeys buried under their enormous loads of henna; veiled, blackrobed women padding in their rear pushing them along at a heavy pace. The mirage is back in its place, so are the distant, high-walled villages, that look so secure and the poplars and the old palm and the heat. In a cloud of dust, you pass a little band with a turbaned leader, a compact *ménage* riding close together, armed men on horses very martial, women on donkeys whose bridles are embossed with silver and hung with gaudy tassels to keep the flies out of their eyes. The green flag of the Mecca pilgrims flies over this patriarchal progress; and, a mile on, you meet, in a pass, another man, blind, on foot, accompanied by a blue dungareed hajji with the dyed red beard of distinction. They, too, are waving an immense green flag.

"There is no God but God and Mahomet is his Prophet," they shout as you come abreast. Hand goes to forehead as your krans ring in the dust and you look back to see them scrambling in the pulver for the spoils while the banner of the Prophet lies neglected where it has fallen across a thorn bush.

10

At nightfall comes Yezd. This is on the edge of the desert with a vengeance.

Yezd is the outback of Moslem Persia. It has less poplars and more winding, more narrow streets around its central square than Ispahan. Its every thoroughfare appears to have been built with a view to providing the robbers with dark corners. Everything in it is enclosed

and shut away from the heat and the local burglar with high, smooth walls; and the bazaars, like those of Ispahan and almost every other town since Adana, are sheltered in the Arab manner with an arched roof above which lets in the light. To the poor European heathen it is a strange sight to see camels and donkeys being driven and ridden about under roofs in these places and it gives one a feeling of indecorousness to have to drive a car through them. It is almost as if you had invaded a private house, more especially as all the merchants pull in their legs and everybody drags out a few rugs and puts them down for you to run over.

11

At first I was greatly disturbed by this practice, and several times stopped the car, thinking it was the Persian's diabolic method of hindering us. But argument only produced a polite signal to proceed. Then I dismissed the custom as a mark of honour by the poor, simple Iranian, doing homage to his high-born visitor. I reflected that it was a typically Oriental proceeding and felt rather inflated every time we encountered it until a friendly Mirza explained it to me.

"No," said he, "it is not for you but for the Americans. The carpet trade is almost dead now. Nobody buys carpets but the Americans. And what they pay for best is the antique. The real antiques, of course, have nearly all gone years upon years ago. If there are any, they are worth their weight in gold a hundred times over. But these Americans—they are never satisfied. So our villagers put their carpets in the road for you and the camels to trample and hang them out in the sun and leave them for the dew to bleach and we give the Americans the

antiques they want. Nine hundred and ninety-nine out of a thousand of them don't know the difference.

"I think there are only five experts in the world who could be safely trusted to determine what is a genuine antique and what is not—one is in Tehran and one is in Kirman and one is in Constantinople; one is in Berlin and Ziegler Brothers—who by the way are Manchester and English of the English—have another, and there is one man at South Kensington Museum. What does it matter? Doesn't it make the Americans happy to own antiques? Well, why then shouldn't we make antiques for them?"

I do not, of course, vouch for the Mirza's catalogue of experts, as I have no desire to be murdered by the hundreds of others who claim competence.

But to return to Yezd. There you may see Parsis in their small, tight, round turbans, possibly more numerously than anywhere else except in Bombay. There, every house of the better class overcomes the heat engendered by the stifling congestion, by erecting a tall graceful bad gir, or wind tower, a sort of chimney with slats upon its sides to catch the breezes; there you may behold fifty old men sitting round the sides of a square pool such as the Persian loves to build in his maidans dabbling their fingers and toes, *coram populo*; or, wandering into some tiny courtyard, where the light is dim with grey-green powder you may watch the holy camel grinding henna with a green stone mill. Round and round and round and round he goes, anchored to the creaking beam above him, blindfold so that he will not become giddy, his lower lip hanging down, his stride exact, his travesty of a tail standing straight up in the air with three solemn hairs on the end of it and green dust covering him and everything about him in a mildew-coloured layer. Hours afterward

you may return and see him still going, and you wonder if he ever sees the sun—whether, indeed, he has ever enjoyed the open air since that father and prince of explorers, Messer Marco Polo startled him with his first sight of a modern European face somewhere early in the thirteenth century.

"It looks rather cruel to us," you say to your Mohammedan guide who has taken you through a back way to see the factory.

"Without the camel no hajji would be able to dye his beard when he comes back from Mecca, so that his virtue and accomplishment would remain unwritten. Neither would finger-nails be dyed as is prescribed. Allah will reward him," he says, grinning.

"Besides, where would our women be? Henna is not only a dye. It makes the hair to grow long and thick as Allah wills. You do not grow bald nor does your beard become thin if you use henna."

NOTES.

No. 1. PHOTOGRAPHING WILD LIFE IN EAST AFRICA. (pp. 1—24.)

Mr. Cherry Kearton is a famous explorer, naturalist and photographer who has travelled a great deal, preferring always to take photographs of, rather than to kill, any noteworthy specimens of the wild animals that he has encountered. In this extract from his book, "Photographing Wild Life Across the World," he describes his experiences in Kenya Colony, East Africa.

- p. 2. to trek across the veldt—to travel across the plain.
- p. 3. off loading—unloading.
a full soan—a full load.
- p. 4. outspan—unharness.
inspanned—harnessed.
- p. 7. spoor—tracks.
- p. 7. bucking—jumping violently.
- p. 9. spruit—water-course.
- p. 10. sweltering—oppressively hot.
pelting across—rushing across.
is clean against—is quite contrary to.
- p. 11. kopje—a small hill.
escarpment—steep slope.
- p. 14. purblind—half-blind.
- p. 17. pug-mark—track made by a lion.
- p. 21. scaled the rise—climbed the slope.
- p. 22. they bayed her—they held her at bay by barking loudly.

No. 2. IN A PERSIAN OIL FIELD. (pp. 25—45.)

An interesting sidelight on a few of the multifarious activities of one of the three great world Oil Combines—the Anglo-Persian—is here given by a London lawyer, Mr. Williamson, who spent several weeks on the spot studying conditions as they are. He has embodied his experiences and conclusions in a noteworthy book, "In a Peesian Oil-Field," from which this extract is taken.

- p. 31. propinquity—nearness.
- p. 32. a heady intoxicant—a very intoxicating drink.
- p. 34. a terrain—ground.
chassis—frame-work.
- p. 35. vetted—examined and repaired.
- p. 36. draw only from 3' to 5' of water—an ocean going liner "draws" from 25' to 35' of water.
- p. 38. their due date—the date on which they hope to reach port.
- p. 40. entente—mutual understanding.
- p. 41. airily—carelessly and unthinkingly.

No. 3. AMERICA AND ENGLAND. (pp. 46—74.)

This extract has been taken from an illuminating book called "America and England," published five years ago by an acute and observant traveller, Mr. Enoch, who spent several months in the United States, traversing it from end to end. Where he tells us, less than a hundred years ago, was almost unpeopled desert is now a fertile, prosperous and inhabited country which is daily becoming more desirable and habitable owing to the energy and the foresight of its settlers.

- p. 48. guerilla—guerilla warfare is the name given to that kind of warfare when small bodies of the enemy are

- continually attacking, and then retreating into the mountains or the forests.
- p. 48. lynchings—lynch law is when the mob takes the law into its own hands and deals out summary justice to offenders.
- p. 49. erosion—wearing away by the action of the weather.
- p. 51. coyote—prairie dog.
- p. 52. milieu—environment, surroundings.
- p. 53. *sui generis*—of a very special nature; of its own kind.
- posse*—quid of assistants.
- p. 54. fallow—uncultivated.
- mirage—an optical illusion; for example, travellers across deserts often think they can see water in the distance, when in reality there is no water there at all.
- p. 56. comminuted—reduced to small particles.
- meed—share, portion.
- p. 57. flumes or aqueducts—specially constructed channels for the transport of water.
- dicta—sayings.
- p. 59. stereotyped—formal.
- p. 59. riparian rights—the rights of the people living or owning property on the banks of rivers or canals.
- cirques—vast circular open spaces in the heart of mountain ranges.
- moraines—rock waste brought down the mountain-sides by glaciers.
- p. 60. serpentinizing—winding in and out.
- p. 64. swastika—an ornament or brooch of a certain peculiar design; it was supposed to bring luck to its wearer.
- adobe—mud.
- p. 67. *in situ*—in its original situation; on the spot.
- lacustrine—lake.
- p. 73. ultima thule—last resting-place.
- tenets—religious beliefs.

No. 2. IN A PERSIAN OIL FIELD. (pp. 25—45.)

An interesting sidelight on a few of the multifarious activities of one of the three great world Oil Combines—the Anglo-Persian—is here given by a London lawyer, Mr. Williamson, who spent several weeks on the spot studying conditions as they are. He has embodied his experiences and conclusions in a noteworthy book, "In a Peesian Oil-Field," from which this extract is taken.

- p. 31. propinquity—nearness.
- p. 32. a heady intoxicant—a very intoxicating drink.
- p. 34. a terrain—ground.
chassis—frame-work.
- p. 35. vetted—examined and repaired.
- p. 36. draw only from 3' to 5' of water—an ocean going liner "draws" from 25' to 35' of water.
- p. 38. their due date—the date on which they hope to reach port.
- p. 40. entente—mutual understanding.
- p. 41. airily—carelessly and unthinkingly.

No. 3. AMERICA AND ENGLAND. (pp. 46—74.)

This extract has been taken from an illuminating book called "America and England," published five years ago by an acute and observant traveller, Mr. Enoch, who spent several months in the United States, traversing it from end to end. Where he tells us, less than a hundred years ago, was almost unpeopled desert is now a fertile, prosperous and inhabited country which is daily becoming more desirable and habitable owing to the energy and the foresight of its settlers.

- p. 48. guerilla—guerilla warfare is the name given to that kind of warfare when small bodies of the enemy are

No. 2. IN A PERSIAN OIL FIELD. (pp. 25-45.)

An interesting sidelight on a few of the multifarious activities of one of the three great world Oil Combines—the Anglo-Persian—is here given by a London lawyer, Mr. Williamson, who spent several weeks on the spot studying conditions as they are. He has embodied his experiences and conclusions in a noteworthy book, "In a Peesian Oil-Field," from which this extract is taken.

- p. 31. propinquity—nearness.
- p. 32. a heady intoxicant—a very intoxicating drink.
- p. 34. a terrain—ground.
chassis—frame-work.
- p. 35. vetted—examined and repaired.
- p. 36. draw only from 3' to 5' of water—an ocean going liner "draws" from 25' to 35' of water.
- p. 38. their due date—the date on which they hope to reach port.
- p. 40. entente—mutual understanding.
- p. 41. airily—carelessly and unthinkingly.

No. 3. AMERICA AND ENGLAND. (pp. 46-74.)

This extract has been taken from an illuminating book called "America and England," published five years ago by an acute and observant traveller, Mr. Enoch, who spent several months in the United States, traversing it from end to end. Where he tells us, less than a hundred years ago, was almost unpeopled desert is now a fertile, prosperous and inhabited country which is daily becoming more desirable and habitable owing to the energy and the foresight of its settlers.

- p. 48. guerilla—guerilla warfare is the name given to that kind of warfare when small bodies of the enemy are

- continually attacking, and then retreating into the mountainous or the forests.
48. lymphatics—lymphatic lary is when the maw takes the lary into its own hands and details out summary justice to offenders.
49. erosion—wearing away by the action of the weather.
50. coyote—prairie dog.
51. milieu—environment, surroundings.
52. sari—genetics—of a very special nature; of its own kind.
53. possé—squad of assistants.
54. falloff—uncultivated.
55. mirage—an optical illusion; for example, travellers across deserts often think they can see water in the distance, which in reality there is no water there at all.
56. comminuted—reduced to small particles.
57. ditches—sharcs, portion.
58. tributaries—rights—the rights of the people living or own-ing property on the banks of rivers or canals.
59. stereotyped—formal.
60. serpentine—winding in and out.
61. swastika—an ornament or brooch of a certain peculiar design; it was supposed to bring luck to its wearer.
62. adobe—mud.
63. lacustrine—lake.
64. in situ—in its original situation; on the spot.
65. p. 73. ultimate thule—last resting-place.
66. tenets—religious beliefs.

No. 4. SWITZERLAND. (pp. 75-97.)

Mr. Douglas Ashley gives a vivid and accurate picture of that delightful country, Switzerland, and of its lovable inhabitants in this extract from his book, "Things Seen in Switzerland in Summer."

- p. 81. ubiquitous—to be found everywhere.
- p. 84. foible—peculiarity.
- p. 85. sacrilege—a terrible crime; originally, the word meant "sinning against sacred things."
- p. 85. the "lions"—i.e. the interesting sights.
- p. 90. P.L.M.—Paris-Lyons Mediterranean Railway. The largest and most important railway-system in France.
- p. 93. savant—scholar.

No. 5. THE CANADIAN PACIFIC RAILWAY. (pp. 98-116.)

First good roads, then railways, are the forerunners of prosperity to an accessible land rich in natural wealth, and the opening up of the Canadian Pacific Railway in the last quarter of the nineteenth century is to a large extent responsible for the position among the nations of the world that Canada holds to-day. Mr. Talbot in his interesting book on "The Canadian Pacific Railway," from which these extracts have been taken, has clearly demonstrated this fact.

- p. 102. blasé—a blasé person is one whom nothing new or unexpected can interest. A person who has seen all there is to see, and experienced everything there is to experience.
- p. 112. equinox—the spring equinox is on or about March 21st, the autumn on or about September 23rd; the word means 'equal night,' and throughout the world equal day and equal night are experienced round about those two dates.

- Late in 1914 Sir Ernest Shackleton, accompanied by a picked body of about 60 experienced men, set sail from Plymouth with two specially constructed and equipped ships, the Endurance and the Aurora, with a view to making, amongst other things, the first crossing from sea to sea by way of the South Pole, (a distance of 1,800 miles), of the vast Antarctic continent.
- Although the gallant leader and his sturdy comrades failed in their attempt, owing entirely to the rigouts of the climate and the relentless power of the ice, the memory of their achievements will last as long as the polar seas continue to exert their fascination over the hardy seamen of the northern continents.
- P. 117. Hoe-ice—an ice-hoe is a large, fairly flat cake of ice. Hoees.
- P. 118. whalers—either: men hunting for whales, or: the ships from which they operate. The first meaning is intended—berge—short for "ice-berg".
- P. 119. pack—here means: ice-hoes all packed up closely together by the force of the wind and sea.
- P. 120. blubber-stove—a stove whose fuel is blubber, that is, ed here.
- P. 121. log—here means: daily record of what had been done or seen.
- P. 122. stricken my tent—uppitched my tent.
- P. 123. antediluvian—pre-historic (literally: before the Flood.) mannered the painter—took hold of the boat-rope.
- P. 124. Cerberus—the mythical three-headed dog that guarded the entrance to Hades. [Hades is the Greek name for the underworld.]
- P. 125. hummock—a solid projecting knob of ice. gallery—the cooking-stove, etc.

hove-to—a ship is said to be hove-to when, by the desire of the captain, it remains motionless on the surface of the sea.

to bear up closer—to get nearer to.

p. 131. tide-rip—a strong current set up by the action of the tide.

stern—the back part of a boat or ship.

abeam—the middle part of a ship.

bows—the front part of a ship.

stroke-oar—the man who rows “stroke” sets the pace of rowing for the other members of the boat-screw.

p. 132. spindrift—flying spray.

amidships—into the centre of the boat.

p. 134. rookery—birds’ breeding-place.

p. 138. bilge—lower part (of ships and boats); the broadest part of a ship’s bottom.

p. 140. debris—rubbish.

No. 7. MY FLIGHT TO THE CAPE. (pp. 145—159.)

Sir Alan Cobham is one of the best known aviators of to-day. Late in 1925 he set out from London, accompanied by two assistants, with a view to flying to Cape Town and back, a distance of over 16,000 miles. He succeeded, and was the first man to complete the return journey by air. This extract from his book, “My Flight to the Cape and Back,” tells us of his experiences as far as Mongalla in the extreme south of the Egyptian Sudan.

p. 146. H. P.—horse-power.

p. 147. hefty—very big and strong.

still camera—i.e., a camera which can only be used when the objects to be photographed are motionless, or practically so. (Most of our ordinary cameras are still cameras.)

p. 150. Monte Carlo—The capital of the tiny Principality of

of Bagdad.

p. 160. Barmeclides—the title given to the former ruling princes

called "Express to Hindustan."

their experiences which are embodied in a most interesting book what happened to them in Persia, and is taken from the record of locomotion, that is by train and steamer. This extract describes to complete their journey by the ordinary available means of any serious accident. From Delhi, however, they were compelled they were fortunate in getting as far as Delhi without encountering any difficulties, set out from London to reach Australia by motor-car. Their adventures were many, as can well be imagined, and early in 1927 two adventurous young Australians, the writer and a friend, and a friend, set out from London to reach Australia by motor-car.

(pp. 160—188.)

No. 8. TRAVELLING THROUGH IRAQ AND PERSIA.

march in six days.]

for him to understand [that we had flown a year's p. 159. it was too much for him—it was far too difficult H.Q.—Head-Quarters.

CORRECT).

O.K! Kreect—an American miner's spelling for ALL p. 156. all was O.K.—i.e. everything was in order. (O.K.=

p. 155. inferno—tumult of noise.

R.A.F.—Royal Air Force.

p. 153. traverse—here means: "room to move about in"

.

p. 153. shots—i.e., photographs.

leeward—sheltered.

p. 152. cocktail—a kind of drink, composed of various different kinds of alcoholic and non-alcoholic ingredients.

p. 152. in the world and is situated on the extreme south-east

Alonaco which is one of the greatest pleasure-treasures

of the coast of France, on the Riviera.